

3. Population

Table A4-1 Population in the Krabi - Khanom Highway Corridor
unit: 1,000 persons

	1985	1989	Growth Rate % pa
KRABI	189.7	212.0	2.8
Muang Krabi	106.8	116.6	2.2
Khao Phanom	24.1	27.5	3.4
Ao Luk	37.5	42.3	3.0
Plai Phraya	21.3	25.6	4.7
SURAT THANI	533.8	573.3	1.8
Muang Surat Thani	106.9	113.1	1.6
Phunphin	83.9	88.4	1.3
Kanchanadit	72.9	76.1	1.1
Ban Na San	65.0	68.6	1.3
Phrasaeng	33.3	39.5	4.4
Wiang Sa	48.2	52.4	2.1
Don Sak	27.5	28.9	1.2
Khiang Sa	21.8	25.9	4.5
Ban Na Doem	65.0	68.6	1.3
Chai Buri	9.3	11.8	6.1
NAKHON SI THAMMARAT	24.7	24.9	0.2
Khanom	24.7	24.9	0.2
Total	748.2	810.2	2.0

4. Number of Factories

Table A4-2 Number of Factories and Employees in 1989

	(1) Factories		(2) Employees		(3) =(2)/(1)
	Number	%	Person	%	
KRABI	135	84	1,270	96	9.4
Muang Krabi	116	72	940	71	8.1
Khao Phanom	-	-	-	-	-
Ao Luk	17	11	247	19	14.5
Plai Phraya	2	1	83	6	41.5
SURAT THANI	556	82	8,565	97	15.4
Muang Surat Thani	256	38	4,060	46	15.9
Phunphin	130	19	2,467	28	19.0
kanchanadit	41	6	362	4	8.8
Ban Na San	13	2	644	7	49.5
Phrasaeng	5	1	164	2	32.8
Wiang Sa	19	3	94	1	4.9
Don Sak	41	6	362	4	8.8
Khiang Sa	49	7	405	5	8.3
Ban Na Doem	2	0	7	0	3.5
Chai Buri	-	-	-	-	-
NAKHON SI THAMMARAT	-	-	-	-	-
Khanom	-	-	-	-	-
Total	691		9,835		14.2

A5 Traffic Survey

Traffic survey in this study comprises of roadside interview survey, classified traffic counts, and travel speed survey.

1. Traffic Survey

- Roadside interview survey

The roadside interview survey was carried out in order to obtain the trip and user information on the vicinity of Krabi-Khanom road link. The locations of survey spots were planned to capture various types of trip making; inter Changwat, inter Amphoe and intra Amphoe. The total 6 points have been selected to attain those information as listed below:

No.	Survey Station No.	Route	Control Section	Kilo Post	Section Name	Location Type
1	OD-1	401	601	6+400	Phun Phin-Surat Thani	Intra-city
2	OD-2	4009	201	42+200	Ban Na San-Wiangsa	"
3	OD-3	4009	202	68+500	Wiangsa-Prasaeng	Amphoe Boundary
4	OD-4	4	3300	106+300	Ao Luk-Krabi	Intra-city
5	OD-5	401	400	52+200	Ban Takhun-Phanom	Amphoe Boundary
6	OD-6	401	100	124+100	Phanom-Takua Pa	Changwat Boundary

The questions included the following information:

- Vehicle Type
- Vehicle Data;
 - Plate Number,
 - Capacity (Passenger or Cargo)
- Trip Data;
 - Origin & Destination,
 - Travel Distance
 - Trip Purpose
 - Number of Passenger
 - Number of Assistance
- Commodity Flow
 - Commodity Type
 - Commodity Weight

The questionnaire form is illustrated in Fig. A5-1. The survey period started from 6:00 a.m. to 6:00 p.m. totaling 12 hours and the survey date were decided to conduct on weekday since they would mainly contain normal traffic.

- Traffic Counts

There are 2 types of traffic counts; 12 hours and 24 hours were carried out. The vehicle types were classified into 10 types to conform with roadside interview survey as shown in the survey form in Fig. A5-2.

To obtain traffic volumes covering all this corridor, the survey stations were fixed on all major highway including the roadside interview locations as listed below:

No.	Survey Station No.	Route	Control Section	Kilo Post	Section Name	Survey Period
1	C-1	401	700	21+100	Surat Thani-Kanchanadit	24 hrs.
2	C-2	4014	100	0+100	Jct. Rt. 401-Khanom	12 hrs.
3	C-3	4040	100	36+500	Jct. Rt. 401-Khao To	12 hrs.
4	C-4	4	3300	131+100	Ao Luk - Krabi	24 hrs.
5	C-5	4037	100	6+100	Jct. Rt. 4-B. Song Pleak	12 hrs.
- all roadside interview survey stations -						12 hrs.

Fig. A5-3 illustrated roadside interview survey and traffic count locations.

- Speed Survey

The test car was used to examined the average travel speed along this Krabi-Khanom corridor. The selected routes for speed survey are shown in Figure A5-4.

- Survey Schedule

The survey schedule including field reconnaissance, traffic survey and data compilation is illustrated in Fig. A5-5.

**ROAD DEVELOPMENT IN THE SOUTHERN REGION
ROADSIDE O-D INTERVIEW**

INTERVIEWER'S NAME _____ STATION NO. _____ OF _____ SHEET NO. _____ OF _____

DATE _____ PERIOD _____ TO _____

CHANGWAT _____ AMPHOE _____ HIGHWAY NO. _____ DIRECTION _____

IN-BOUND _____ OUT-BOUND _____

VEHICLE TYPE	VEH. DATA		ORIGIN	DESTINATION	DISTANCE km.	PURPOSE	NO OF PRSN	TRUCK		COMMODITY TYPE
	NO. OF PLATE	CAPACITY TON						ASST	COMMODITY WT TYPE	
1. Car			Changwat	Changwat		1 Work or Business			1 Empty	1 Rice
2. Light bus			Amphoe	Amphoe		2 Private			2 1/4 F	2 Sand, Gravel
3. Med. bus			Changwat	Changwat		3 Tour			3 1/2 F	3 Cement and products
4. Heavy bus			Changwat	Changwat		4 Other			4 Full	4 Steel
5. Pickup prsn			Changwat	Changwat		1 Work or Business			1 Empty	5 Construction materials
6. Pickup cargo			Amphoe	Amphoe		2 Private			2 1/4 F	6 Timber
7. 4-w truck			Changwat	Changwat		3 Tour			3 1/2 F	7 Firewood
8. 6-w truck			Changwat	Changwat		4 Other			4 Full	8 Petroleum products
9. 10-w truck			Changwat	Changwat		1 Work or Business			1 Empty	9 Minerals
10. Motorcycle			Amphoe	Amphoe		2 Private			2 1/4 F	10 Vegetable and fruit
			Changwat	Changwat		3 Tour			3 1/2 F	11 Cassava
			Changwat	Changwat		4 Other			4 Full	12 Maize
			Changwat	Changwat		1 Work or Business			1 Empty	13 Sugar Cane
			Amphoe	Amphoe		2 Private			2 1/4 F	14 Bean
			Changwat	Changwat		3 Tour			3 1/2 F	15 Jute and products
			Changwat	Changwat		4 Other			4 Full	16 Rubber
			Changwat	Changwat		1 Work or Business			1 Empty	17 Palm
			Amphoe	Amphoe		2 Private			2 1/4 F	18 Beverages
			Changwat	Changwat		3 Tour			3 1/2 F	19 Grocery
			Changwat	Changwat		4 Other			4 Full	20 Animal
			Changwat	Changwat		1 Work or Business			1 Empty	21 Fish
			Amphoe	Amphoe		2 Private			2 1/4 F	22 Fertilizer & animal feed
			Changwat	Changwat		3 Tour			3 1/2 F	23 Household appliances
			Changwat	Changwat		4 Other			4 Full	24 Other manufactures
			Changwat	Changwat		1 Work or Business			1 Empty	25 All others
			Amphoe	Amphoe		2 Private			2 1/4 F	
			Changwat	Changwat		3 Tour			3 1/2 F	
			Changwat	Changwat		4 Other			4 Full	

Fig. A5-1 ROADSIDE OD QUESTIONNAIRE FORM

ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION 1990												Sheet No. 1
STATION NAME		DIRECTION		SUPERVISOR'S NAME		DATE		MONT		DAY		REMARKS
		FROM	TO	SURVEYER'S NAME								
Hours	1 Passenger car & Taxi	2 Bus Light	3 Bus Medium	4 Bus Heavy	5 Pickup Pass	6 Pickup Cargo	7 Truck 4 W	8 Truck 6 W	9 Truck 10 W	10 Motor-cycle		
06:00 - 06:15												
06:15 - 06:30												
06:30 - 06:45												
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17:45 - 18:00												

Fig. A5-2 CLASSIFIED TRAFFIC COUNT SUMMARY SHEET

ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION 1990												Sheet No. 2
STATION NAME		DIRECTION		SUPERVISOR'S NAME		DATE		MONT		DAY		REMARKS
		FROM	TO	SURVEYER'S NAME								
Hours	1 Passenger car & Taxi	2 Bus Light	3 Bus Medium	4 Bus Heavy	5 Pickup Pass	6 Pickup Cargo	7 Truck 4 W	8 Truck 6 W	9 Truck 10 W	10 Motor-cycle		
18:00 - 18:15												
18:15 - 18:30												
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Fig. A5-2 CLASSIFIED TRAFFIC COUNT SUMMARY SHEET (CON'T)

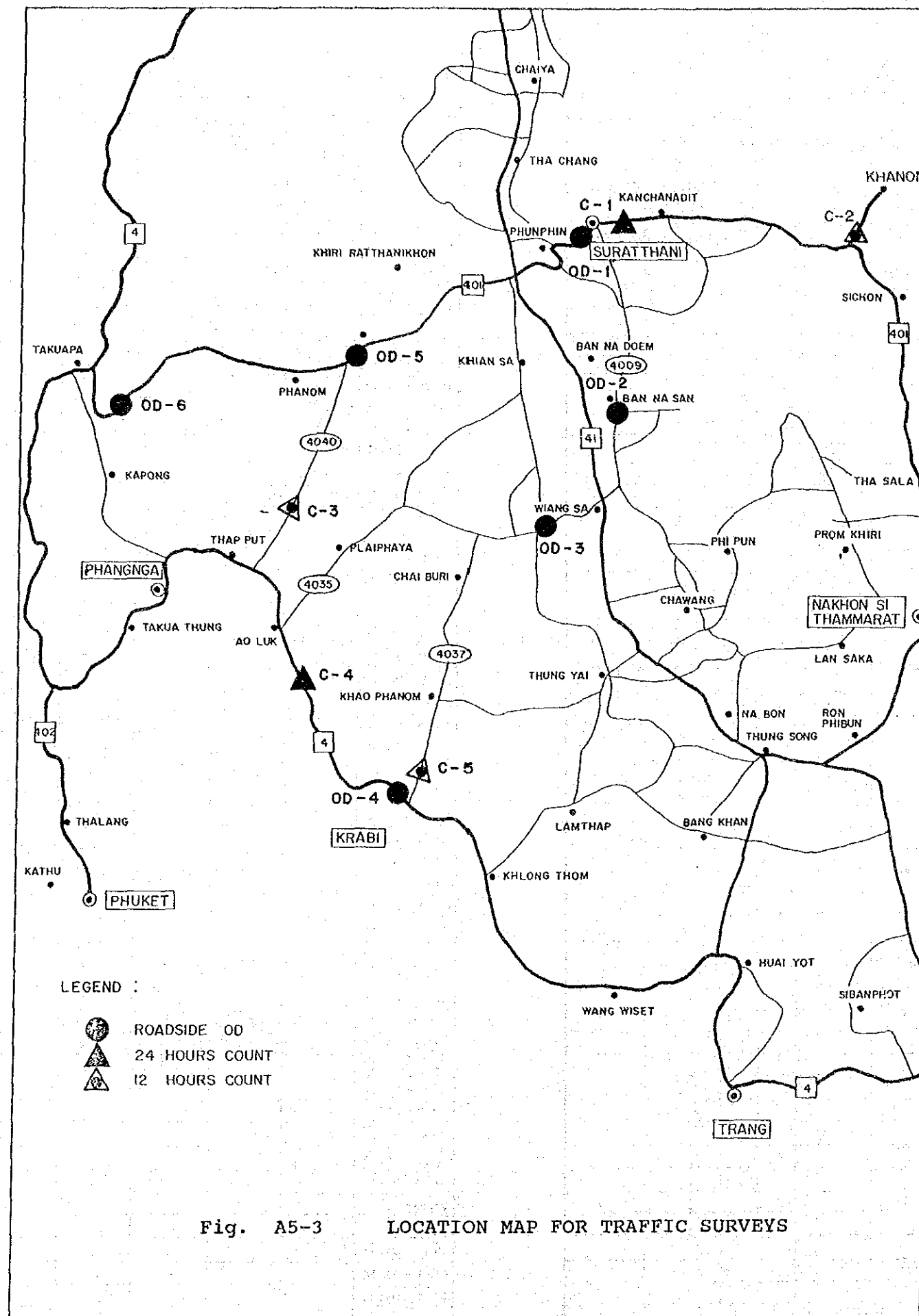


Fig. A5-3 LOCATION MAP FOR TRAFFIC SURVEYS

5) Commodity Flows

The commodity types and their volume in weight by each station and overall average figures are shown in Table A5-5.

- Traffic Counts

The hourly traffic volumes counted by each survey station are summarized in Table A5-6, while their fluctuations and compositions are illustrated in Fig. A5-6 and 7.

- Speed Survey

The average traveling speed were classified by road sections which were fouded to have homogenous speed. The results are illustrated in Fig. A5-4.

Table A5-2 EXPANSION FACTOR FROM 12 HOURS VOLUME TO 24 HOURS VOLUME

Sta.\Type	PC	LB	MB	HB	PU(p)	PU(c)	4W	6W	10W	MC
C-1-out	1.23	1.24	1.04	1.26	1.35	1.24	1.16	1.35	1.73	1.37
C-1-in	1.24	1.19	1.00	1.54	1.36	1.35	1.43	1.35	1.88	1.28
C-4-out	1.22	1.38	1.04	1.02	1.27	1.30	1.50	1.20	2.19	1.29
C-4-in	1.21	1.04	1.04	1.06	1.36	1.27	1.50	1.37	1.94	1.32
Average	1.23	1.21	1.03	1.22	1.34	1.29	1.4	1.32	1.94	1.32

Note : PC = Passenger Car PU(p) = Pickup (passenger) 10W = 10 Wheel Truck
 LB = Light Bus PU(c) = Pickup (cargo) MC = Motorcycle
 MB = Medium Bus 4W = 4 Wheel Truck
 HB = Heavy Bus 6W = 6 Wheel Truck

Table A5-1 SAMPLING RATES OF ROADSIDE OD SURVEY BY STATION

Station Direction	Passenger Car		Light Bus		Medium Bus		Heavy Bus		Pickup (passenger)		Pickup (cargo)							
	No. of Counted Samples	Rate (%)	No. of Counted Samples	Rate (%)	No. of Counted Samples	Rate (%)	No. of Counted Samples	Rate (%)	No. of Counted Samples	Rate (%)	No. of Counted Samples	Rate (%)						
001 In	240	28.47	10	195	8	40.00	112	267	41.95	628	2,935	21.40	141	268	52.61			
001 Out	222	24.67	11	191	7	30.43	133	299	44.48	644	2,180	29.54	220	749	29.37			
002 In	42	46.15	12	27	0	0.00	18	21	85.71	251	494	50.81	22	63	34.92			
002 Out	24	21.82	7	30	1	25.00	18	27	66.67	94	399	23.56	38	115	33.04			
003 In	31	47	65.96	80	3	37.50	16	20	80.00	255	396	64.39	56	70	80.00			
003 Out	48	75	64.00	65	0	0.00	18	25	72.00	280	381	73.49	57	119	47.90			
004 In	180	285	63.16	86	7	23.33	40	52	76.92	410	841	48.75	53	112	47.32			
004 Out	158	285	55.44	86	9	30.00	38	52	73.08	441	841	52.44	35	112	31.25			
005 In	32	44	72.73	1	100.00	36	37	97.30	11	23	47.83	159	286	167	60.48			
005 Out	30	46	65.22	2	3	66.67	30	17	58.82	128	217	58.99	95	152	62.50			
006 In	37	40	92.50	5	7	71.43	0	24	79.17	63	75	84.00	18	20	90.00			
006 Out	37	43	86.05	8	11	72.73	0	17	52.94	53	75	70.67	10	17	58.82			
Average	1,081	2,809	38.48	177	782	22.63	101	198	51.01	442	844	52.37	3,406	9,120	37.35	846	1,964	43.08

Table A5-1 SAMPLING RATES OF ROADSIDE OD SURVEY BY STATION (CON'T)

Station Direction	4W Truck			6W Truck			10W Truck			Motorcycl.			Total		
	No. of Counted Sampling	Rate (%)	Rate (%)	No. of Counted Sampling	Rate (%)	Rate (%)	No. of Counted Sampling	Rate (%)	Rate (%)	No. of Counted Sampling	Rate (%)	Rate (%)			
001 In	12	64	18.75	90	336	26.79	121	256	47.27	118	1,700	6.94	1,480	6,884	21.50
001 Out	11	48	22.92	92	391	23.53	146	392	37.24	80	1,762	4.54	1,566	6,935	22.58
002 In	1	2	50.00	20	55	36.36	33	64	51.56	57	1,069	5.33	456	1,886	24.18
002 Out	0	2	0.00	13	64	20.31	39	146	26.71	29	989	2.93	263	1,886	13.94
003 In	4	9	44.44	32	60	53.33	64	73	87.67	125	375	33.33	633	1,138	55.62
003 Out	2	6	33.33	35	59	59.32	86	116	74.14	46	431	10.67	585	1,286	45.49
004 In	32	35	91.43	16	111	14.41	99	260	38.08	159	1,382	11.51	1,030	3,194	32.25
004 Out	6	35	17.14	38	111	34.23	87	260	33.46	50	138	36.23	889	1,950	45.59
005 In	1	3	33.33	18	36	50.00	27	46	58.70	83	213	38.97	469	856	54.79
005 Out	0	4	0.00	13	31	41.94	42	69	60.87	102	239	42.68	452	811	55.73
006 In	2	2	100.00	8	13	61.54	9	15	60.00	64	114	56.14	225	312	72.12
006 Out	0	0	0.00	6	10	60.00	8	10	80.00	47	99	47.47	178	284	62.68
Average	71	210	33.81	381	1,277	29.84	761	1,707	44.58	960	8,511	11.28	8,226	27,422	30.00

Table A5-3 SUMMARY OF ROADSIDE OD SURVEY RESULTS

Summary of Roadside OD Survey Results: Station 00-1

Item/Vehicle Type	Passenger Car		Light Bus		Medium Bus		Heavy Bus		Pickup (Pass)		Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck		Motorcycle	
	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average
Total Weight(ton)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	361	2.42	23	5.07	181	10.07	266	19.97	0	0.00
Cargo Capacity(ton)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	361	1.00	23	2.77	181	9.31	266	6.33	0	0.00
Passenger Capacity	453	5.28	18	12.50	15	30.80	247	53.79	92	10.21	1	14.00	1	2.00	1	2.00	2	18.00	196	2.81
Travel Distance(km)	414	52.38	21	35.95	14	15.00	151	160.93	1187	43.32	329	53.07	20	28.80	156	44.26	172	81.18	195	23.28
Trip Purpose		(%)		(%)		(%)		(%)		(%)		(%)		(%)		(%)		(%)		(%)
- Work or Business	186	40.52	11	52.38	6	75.00	134	99.26	657	51.77	255	71.23	19	82.61	158	87.29	228	85.39	75	37.88
- Private	266	53.59	6	28.57	0	0.00	0	0.00	559	44.05	72	20.11	3	13.04	16	8.84	16	5.99	103	52.02
- Tour	10	2.18	1	4.76	0	0.00	1	0.74	10	0.79	3	0.84	1	4.35	1	0.55	1	0.37	5	2.53
- Others	17	3.70	3	14.29	2	25.00	0	0.00	43	3.39	28	7.82	0	0.00	6	3.31	22	8.24	15	7.58
Number of Passenger	457	2.60	21	4.62	15	28.53	244	42.70	1257	2.32	341	1.78	23	2.22	178	1.75	252	2.15	191	1.34
Number of Assistant	18	1.50	0	0.00	13	1.00	244	1.39	100	1.38	72	1.36	8	1.25	68	1.40	108	1.21	3	2.33

Summary of Roadside OD Survey Results: Station 00-2

Item/Vehicle Type	Passenger Car		Light Bus		Medium Bus		Heavy Bus		Pickup (Pass)		Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck		Motorcycle	
	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average
Total Weight(ton)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	58	2.491379	1	4	34	10.39706	72	19.94722	1	15
Cargo Capacity(ton)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	58	1.00	1	1.70	34	10.02	72	8.20	1	15.00
Passenger Capacity	66	5.38	19	14.42	1	34.00	40	60.00	3	40.00	2	5.00	0	0.00	0	0.00	0	0.00	85	2.02
Travel Distance(km)	52	55.12	19	42.21	1	10.00	37	142.43	328	47.27	57	40.33	1	5.00	32	68.47	59	74.05	86	13.93
Trip Purpose		(%)		(%)		(%)		(%)		(%)		(%)		(%)		(%)		(%)		(%)
- Work or Business	17	25.76	18	94.74	1	100.00	40	100.00	143	41.57	42	70.00	1	100.00	32	91.43	68	94.44	7	8.14
- Private	47	71.21	1	5.26	0	0.00	0	0.00	198	57.56	17	28.33	0	0.00	3	8.57	1	1.39	76	88.37
- Tour	2	3.03	0	0.00	0	0.00	0	0.00	1	0.29	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
- Others	0	0.00	0	0.00	0	0.00	0	0.00	2	0.58	1	1.67	0	0.00	0	0.00	0	0.00	3	3.49
Number of Passenger	66	2.91	18	5.39	1	12.00	38	42.32	342	2.56	60	1.53	1	2.00	33	1.91	71	1.68	86	1.27
Number of Assistant	15	1.33	9	1.11	1	1.00	59	1.21	113	1.34	13	1.46	0	0.00	19	1.16	30	1.13	8	1.00

Table A5-3 SUMMARY OF ROADSIDE OD SURVEY RESULTS (CON'T)

Summary of Roadside OD Survey Results: Station 00-3

Item/Vehicle Type	Passenger Car		Light Bus		Medium Bus		Heavy Bus		Pickup (Pass)		Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck		Motorcycle	
	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average
Total Weight(ton)	0	0.00	3	3.50	0	0.00	0	0.00	530	2.54	110	2.49	6	3.25	67	9.94	150	20.07	0	0.00
Cargo Capacity(ton)	0	0.00	3	3.50	0	0.00	0	0.00	530	2.54	110	2.49	6	3.25	67	9.94	150	20.07	0	0.00
Passenger Capacity	80	5.89	58	17.10	3	20.00	38	59.89	5	10.60	4	24.25	0	0.00	0	0.00	0	0.00	170	2.02
Travel Distance(km)	55	131.62	60	29.72	3	14.00	32	147.09	472	65.14	96	60.85	5	74.20	56	57.20	90	143.19	166	33.85
Trip Purpose	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
- Work or Business	31	38.75	45	75.00	3	100.00	37	100.00	246	46.33	81	71.68	4	66.67	57	85.07	138	92.00	30	17.65
- Private	45	56.25	14	23.33	0	0.00	0	0.00	276	51.98	29	25.66	2	33.33	7	10.45	4	2.67	138	81.18
- Tour	4	5.00	1	1.67	0	0.00	0	0.00	4	0.75	2	1.77	0	0.00	1	1.49	1	0.67	0	0.00
- Others	0	0.00	0	0.00	0	0.00	0	0.00	5	0.94	1	0.88	0	0.00	2	2.99	7	4.67	2	1.18
Number of Passenger	79	3.27	60	7.85	3	9.00	38	43.71	534	3.06	113	2.31	6	2.00	66	2.48	148	1.64	171	1.89
Number of Assistant	2	1.00	23	1.26	2	1.00	33	1.06	84	1.40	6	1.50	2	1.00	16	1.25	42	1.00	3	1.67

Summary of Roadside OD Survey Results: Station 00-4

Item/Vehicle Type	Passenger Car		Light Bus		Medium Bus		Heavy Bus		Pickup (Pass)		Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck		Motorcycle	
	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average
Total Weight(ton)	0	0.00	0	0.00	2	11.25	1	3.00	837	2.52	87	2.47	38	5.34	54	11.20	186	20.44	0	0.00
Cargo Capacity(ton)	0	0.00	0	0.00	2	11.25	1	3.00	837	2.52	87	2.47	38	5.34	54	11.20	186	20.44	0	0.00
Passenger Capacity	338	5.82	60	13.85	14	20.64	77	58.26	17	10.82	1	2.00	0	0.00	0	0.00	2	43.00	209	2.01
Travel Distance(km)	99	18.05	53	10.08	15	9.80	60	224.63	372	25.28	37	38.81	16	14.75	16	15.75	87	22.25	130	11.68
Trip Purpose	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
- Work or Business	73	21.79	58	95.08	14	87.50	76	98.70	288	33.96	59	67.05	35	92.11	49	92.45	180	96.77	29	13.94
- Private	217	64.78	2	3.28	1	6.25	0	0.00	542	63.92	29	32.95	3	7.89	4	7.55	5	2.89	176	84.62
- Tour	45	13.43	1	1.64	1	6.25	0	0.00	17	2.00	0	0.00	0	0.00	0	0.00	1	0.54	3	1.44
- Others	0	0.00	0	0.00	0	0.00	1	1.30	1	0.12	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Number of Passenger	337	3.22	58	10.50	16	16.69	78	44.65	847	2.61	88	2.75	37	1.89	54	1.74	185	1.66	209	1.49
Number of Assistant	45	1.71	9	1.11	0	0.00	75	1.79	128	1.50	13	1.38	26	1.19	7	1.57	64	1.22	2	1.00

Table A5-3 SUMMARY OF ROADSIDE OD SURVEY RESULTS (CON'T)

Summary of Roadside OD Survey Results: Station 00-5

Item/Vehicle Type	Passenger Car		Light Bus		Medium Bus		Heavy Bus		Pickup (Pass)		Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck		Motorcycle	
	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average
Total Weight(ton)	0	0.00	2	2.50	0	0.00	0	0.00	288	2.58	196	2.50	1	3.20	31	9.01	71	16.32	2	42.25
Cargo Capacity(ton)	0	0.00	2	2.50	0	0.00	0	0.00	288	2.58	196	2.50	1	3.20	31	9.01	71	16.32	2	42.25
Passenger Capacity	62	6.32	1	12.00	66	20.00	24	58.50	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	180	2.03
Travel Distance(km)	3	42.33	0	0.00	3	19.00	0	0.00	55	67.18	42	85.76	0	0.00	5	238.40	1	150.00	70	19.77
Trip Purpose	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
- Work or Business	19	30.65	2	66.67	66	100.00	25	100.00	140	49.47	134	68.02	1	100.00	30	96.77	68	97.16	71	36.59
- Private	29	46.77	1	33.33	0	0.00	0	0.00	136	48.06	60	30.46	0	0.00	0	0.00	2	2.86	111	60.33
- Tour	14	22.58	0	0.00	0	0.00	0	0.00	7	2.47	3	1.52	0	0.00	1	3.23	0	0.00	2	1.09
- Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Number of Passenger	61	3.44	3	4.67	66	10.65	25	42.04	277	3.13	195	2.91	1	3.00	30	3.47	68	1.49	180	2.30
Number of Assistant	0	0.00	0	0.00	0	0.00	1	2.00	2	1.50	2	2.00	1	2.00	6	1.67	14	1.43	1	1.00

Summary of Roadside OD Survey Results: Station 00-6

Item/Vehicle Type	Passenger Car		Light Bus		Medium Bus		Heavy Bus		Pickup (Pass)		Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck		Motorcycle	
	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average
Total Weight(ton)	1	5.00	0	0.00	0	0.00	0	0.00	116	2.50	29	2.50	1	6.00	14	9.30	17	20.18	1	2.50
Cargo Capacity(ton)	1	5.00	0	0.00	0	0.00	0	0.00	116	2.50	29	2.50	1	6.00	14	9.30	17	20.18	1	2.50
Passenger Capacity	74	6.50	13	12.00	0	0.00	32	51.78	2	47.50	0	0.00	1	34.00	0	0.00	0	0.00	110	2.00
Travel Distance(km)	44	204.84	1	190.00	0	0.00	7	173.57	94	151.67	20	175.55	1	156.00	10	115.70	13	229.69	108	27.34
Trip Purpose	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
- Work or Business	11	14.86	11	84.62	0	0.00	19	59.38	40	34.19	24	82.76	2	100.00	13	92.86	15	88.24	35	31.82
- Private	42	56.76	2	15.38	0	0.00	2	6.25	74	63.25	4	13.79	0	0.00	1	7.14	2	11.76	72	65.45
- Tour	21	28.38	0	0.00	0	0.00	11	34.38	3	2.56	0	0.00	0	0.00	0	0.00	0	0.00	3	2.73
- Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	3.45	0	0.00	0	0.00	0	0.00	0	0.00
Number of Passenger	73	3.86	12	6.50	0	0.00	32	32.16	116	2.68	29	2.59	2	2.50	14	1.79	17	1.41	107	1.51
Number of Assistant	3	1.67	0	0.00	0	0.00	12	1.00	4	2.25	4	1.25	1	2.00	4	1.75	2	1.00	2	1.00

Table A5-3 SUMMARY OF ROADSIDE OD SURVEY RESULTS (CON'T)

Summary of Roadside OD Survey Results: Overall

Item/Vehicle Type	Passenger Car		Light Bus		Medium Bus		Heavy Bus		Pickup (Pass)		Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck		Motorcycle		
	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	Number	Average	
Total Weight(ton)	1	0.00	5	0.00	2	0.00	1	0.00	2116	0.00	841	2.46	70	5.03	381	10.12	762	19.77	4	0.00	
Cargo Capacity(ton)	1	0.00	5	0.00	2	0.00	1	0.00	2116	0.00	841	1.00	70	2.73	381	9.56	762	7.28	4	0.00	
Passenger Capacity	1073	5.65	169	14.73	99	21.87	458	55.70	119	11.69	8	15.38	2	0.00	1	0.00	4	0.00	950	2.18	
Travel Distance(km)	667	64.04	154	26.39	36	12.94	287	170.63	2508	49.85	581	58.78	43	31.26	275	54.06	422	86.00	755	22.80	
Trip Purpose		(%)		(%)		(%)		(%)		(%)		(%)		(%)		(%)		(%)		(%)	
- Work or Business	337	31.32	145	81.92	90	95.74	331	95.66	1314	44.63	595	70.41	62	87.32	339	88.98	697	91.47	247	25.24	
- Private	626	58.18	26	14.69	1	1.06	2	0.58	1785	52.62	211	24.97	8	11.27	131	8.14	30	3.94	676	70.71	
- Tour	96	8.92	3	1.69	1	1.06	12	3.47	42	1.24	8	0.95	1	1.41	3	0.79	3	0.39	13	1.36	
- Others	17	1.58	3	1.69	2	2.13	1	0.29	51	1.50	31	3.67	0	0.00	8	2.10	32	4.20	20	2.09	
Number of Passenger	1073	2.99	172	7.94	101	14.23	455	42.31	3353	2.61	826	2.23	70	3.04	375	2.03	759	1.80	944	1.67	
Number of Assistant	83	1.58	41	1.20	16	1.00	404	1.41	431	1.42	110	1.39	38	1.24	120	1.38	260	1.18	19	1.32	

Table A5-4 NUMBER OF EMPTY VEHICLE

Station/Vehicle Type	Pickup(Cargo)		4W-Truck		6W-Truck		10W-Truck	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
00-1	258	71.47	15	65.22	92	50.55	92	34.59
00-2	44	73.33	1	100.00	19	54.29	39	54.17
00-3	67	59.29	3	50.00	39	58.21	42	28.00
00-4	59	67.82	28	73.68	28	51.85	113	60.75
00-5	154	78.57	1	100.00	14	45.16	33	46.48
00-6	15	51.72	1	50.00	6	42.86	6	35.29
Total	597	71.21	49	70.23	198	51.99	325	46.40

Table A5-5 LOADED FACTORS BY CARGO AND VEHICLE TYPE

Loaded Factors by Cargo and Vehicle Type: Station 00-1

Cargo/Vehicle	Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck	
	Number	Average	Number	Average	Number	Average	Number	Average
1. Rice	0	0.00	0	0.00	2	4.70	8	6.59
2. Sand, Gravel	0	0.00	0	0.00	6	7.79	13	5.66
3. Cement and prod.	0	0.00	0	0.00	4	9.00	4	6.13
4. Steel	2	0.75	1	1.85	1	2.15	5	5.60
5. Constructn mat.	2	0.63	1	0.93	4	8.50	1	5.25
6. Timber	1	1.00	1	0.10	7	7.43	15	6.86
7. Firewood	0	0.00	0	0.00	0	0.00	0	0.00
8. Petroleum prod.	8	0.66	1	2.70	5	7.74	38	6.53
9. Minerals	0	0.00	0	0.00	0	0.00	0	0.00
10. Vegetable, Fruit	27	0.64	0	0.00	7	9.07	10	5.63
11. Cassava	0	0.00	0	0.00	0	0.00	0	0.00
12. Maize	0	0.00	0	0.00	0	0.00	0	0.00
13. Sugar cane	1	1.00	0	0.00	0	0.00	0	0.00
14. Bean	0	0.00	0	0.00	0	0.00	0	0.00
15. Jute and prod.	0	0.00	0	0.00	0	0.00	0	0.00
16. Rubber	5	0.95	0	0.00	4	8.30	15	4.85
17. Palm	3	0.67	0	0.00	7	7.71	7	5.77
18. Beverages	14	0.86	1	1.70	8	9.09	2	6.13
19. Grocery	6	0.67	1	1.85	1	6.00	2	6.13
20. Live stock	2	1.00	0	0.00	5	4.35	8	5.31
21. Fish	4	0.69	0	0.00	5	6.76	15	6.72
22. Ferti.& Ani.Feed	3	0.83	0	0.00	3	5.63	5	5.60
23. Household App.	1	0.50	0	0.00	2	3.75	0	0.00
24. Other manufac.	5	0.50	1	3.70	0	0.00	0	0.00
25. All others	19	0.72	1	2.78	15	6.19	15	7.17
26. Unidentified	0	0.00	0	0.00	0	0.00	1	7.00
Total	103	0.72	8	1.95	86	7.22	163	6.18

Table A5-5 LOADED FACTORS BY CARGO AND VEHICLE TYPE (CON'T)

Loaded Factors by Cargo and Vehicle Type: Station 00-2

Cargo\Vehicle	Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck	
	Number	Average	Number	Average	Number	Average	Number	Average
1. Rice	0	0.00	0	0.00	0	0.00	0	0.00
2. Sand, Gravel	0	0.00	0	0.00	3	5.38	2	9.50
3. Cement and prod.	0	0.00	0	0.00	0	0.00	5	7.53
4. Steel	0	0.00	0	0.00	0	0.00	0	0.00
5. Constructn mat.	0	0.00	0	0.00	1	12.00	2	5.94
6. Timber	1	1.00	0	0.00	2	7.25	2	8.75
7. Firewood	0	0.00	0	0.00	0	0.00	0	0.00
8. Petroleum prod.	1	1.00	0	0.00	1	10.00	11	8.49
9. Minerals	0	0.00	0	0.00	0	0.00	3	8.08
10. Vegetable, Fruit	4	0.69	0	0.00	0	0.00	0	0.00
11. Cassava	1	0.50	0	0.00	0	0.00	0	0.00
12. Maize	0	0.00	0	0.00	0	0.00	0	0.00
13. Sugar cane	0	0.00	0	0.00	0	0.00	0	0.00
14. Bean	0	0.00	0	0.00	0	0.00	0	0.00
15. Jute and prod.	0	0.00	0	0.00	0	0.00	0	0.00
16. Rubber	2	0.50	0	0.00	2	1.95	1	4.75
17. Palm	0	0.00	0	0.00	0	0.00	0	0.00
18. Beverages	0	0.00	0	0.00	0	0.00	2	8.31
19. Grocery	1	0.25	0	0.00	0	0.00	1	3.50
20. Live stock	0	0.00	0	0.00	0	0.00	0	0.00
21. Fish	1	0.50	0	0.00	0	0.00	1	10.50
22. Ferti.& Ani.Feed	0	0.00	0	0.00	0	0.00	0	0.00
23. Household App.	0	0.00	0	0.00	1	5.00	1	4.75
24. Other manufac.	1	1.00	0	0.00	0	0.00	1	7.13
25. All others	4	0.44	0	0.00	6	7.77	1	7.13
26. Unidentified	0	0.00	0	0.00	0	0.00	0	0.00
Total	16	0.61	0	0.00	16	6.76	33	7.82

Table A5-5 LOADED FACTORS BY CARGO AND VEHICLE TYPE (CON'T)

Loaded Factors by Cargo and Vehicle Type: Station 00-3

Cargo\Vehicle	Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck	
	Number	Average	Number	Average	Number	Average	Number	Average
1. Rice	1	1.00	0	0.00	0	0.00	1	5.25
2. Sand, Gravel	2	0.88	0	0.00	9	8.67	6	8.31
3. Cement and prod.	0	0.00	0	0.00	1	7.50	12	8.10
4. Steel	0	0.00	0	0.00	1	2.50	0	0.00
5. Constructn mat.	1	0.75	0	0.00	3	10.00	3	8.71
6. Timber	1	0.50	0	0.00	2	10.00	7	8.20
7. Firewood	0	0.00	0	0.00	0	0.00	0	0.00
8. Petroleum prod.	5	0.85	0	0.00	0	0.00	26	9.13
9. Minerals	0	0.00	0	0.00	0	0.00	28	8.62
10. Vegetable, Fruit	7	0.82	0	0.00	0	0.00	0	0.00
11. Cassava	0	0.00	0	0.00	0	0.00	0	0.00
12. Maize	0	0.00	0	0.00	0	0.00	0	0.00
13. Sugar cane	0	0.00	0	0.00	0	0.00	0	0.00
14. Bean	0	0.00	0	0.00	0	0.00	0	0.00
15. Jute and prod.	0	0.00	0	0.00	0	0.00	0	0.00
16. Rubber	9	0.78	0	0.00	1	10.00	5	9.70
17. Palm	1	1.00	0	0.00	0	0.00	6	8.69
18. Beverages	1	0.25	0	0.00	1	10.00	3	8.67
19. Grocery	3	0.50	0	0.00	0	0.00	0	0.00
20. Live stock	0	0.00	1	0.20	0	0.00	1	10.50
21. Fish	3	0.92	0	0.00	2	10.00	1	9.50
22. Ferti.& Ani.Feed	2	0.88	1	0.15	0	0.00	7	8.89
23. Household App.	2	1.00	0	0.00	0	0.00	0	0.00
24. Other manufac.	2	1.00	0	0.00	0	0.00	0	0.00
25. All others	6	0.71	1	0.93	7	7.07	2	7.13
26. Unidentified	0	0.00	0	0.00	0	0.00	0	0.00
Total	46	0.79	3	0.43	27	8.43	108	8.68

Table A5-5 LOADED FACTORS BY CARGO AND VEHICLE TYPE (CON'T)

Loaded Factors by Cargo and Vehicle Type: Station 00-4

Cargo\Vehicle	Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck	
	Number	Average	Number	Average	Number	Average	Number	Average
1. Rice	0	0.00	1	0.93	0	0.00	1	7.00
2. Sand, Gravel	0	0.00	5	2.26	8	9.19	26	8.43
3. Cement and prod.	1	0.75	0	0.00	2	6.00	3	7.00
4. Steel	1	0.25	0	0.00	0	0.00	2	4.38
5. Constructn mat.	4	0.63	0	0.00	2	7.50	3	6.42
6. Timber	0	0.00	0	0.00	1	12.00	2	7.25
7. Firewood	1	0.75	0	0.00	0	0.00	2	6.25
8. Petroleum prod.	0	0.00	0	0.00	2	4.50	3	8.17
9. Minerals	0	0.00	0	0.00	1	12.00	10	7.76
10. Vegetable, Fruit	1	0.75	0	0.00	1	6.00	0	0.00
11. Cassava	0	0.00	0	0.00	0	0.00	0	0.00
12. Maize	0	0.00	0	0.00	0	0.00	0	0.00
13. Sugar cane	0	0.00	0	0.00	0	0.00	0	0.00
14. Bean	0	0.00	0	0.00	0	0.00	0	0.00
15. Jute and prod.	0	0.00	0	0.00	0	0.00	0	0.00
16. Rubber	0	0.00	0	0.00	0	0.00	4	7.00
17. Palm	0	0.00	0	0.00	1	12.00	6	4.98
18. Beverages	1	0.75	0	0.00	0	0.00	0	0.00
19. Grocery	2	0.75	1	3.70	2	2.80	0	0.00
20. Live stock	2	0.70	1	0.43	1	9.20	1	10.50
21. Fish	1	0.75	1	3.70	0	0.00	1	7.00
22. Ferti.& Ani.Feed	1	1.00	0	0.00	0	0.00	1	2.63
23. Household App.	3	0.58	0	0.00	1	12.00	2	12.85
24. Other manufac.	4	0.44	1	2.78	3	6.83	1	7.00
25. All others	6	0.63	0	0.00	1	9.00	5	7.00
26. Unidentified	0	0.00	0	0.00	0	0.00	0	0.00
Total	28	0.63	10	2.28	26	7.99	73	7.54

Table A5-5 LOADED FACTORS BY CARGO AND VEHICLE TYPE (CON'T)

Loaded Factors by Cargo and Vehicle Type: Station 00-5

Cargo\Vehicle	Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck	
	Number	Average	Number	Average	Number	Average	Number	Average
1. Rice	0	0.00	0	0.00	0	0.00	0	0.00
2. Sand, Gravel	0	0.00	0	0.00	0	0.00	1	7.00
3. Cement and prod.	0	0.00	0	0.00	0	0.00	0	0.00
4. Steel	0	0.00	0	0.00	0	0.00	0	0.00
5. Constructn mat.	2	1.00	0	0.00	1	1.20	4	6.53
6. Timber	1	1.00	0	0.00	2	12.00	3	7.00
7. Firewood	0	0.00	0	0.00	0	0.00	0	0.00
8. Petroleum prod.	1	0.75	0	0.00	0	0.00	13	5.98
9. Minerals	0	0.00	0	0.00	0	0.00	0	0.00
10. Vegetable, Fruit	7	0.82	0	0.00	2	8.40	1	7.00
11. Cassava	1	1.00	0	0.00	0	0.00	0	0.00
12. Maize	0	0.00	0	0.00	0	0.00	0	0.00
13. Sugar cane	0	0.00	0	0.00	0	0.00	0	0.00
14. Bean	0	0.00	0	0.00	0	0.00	0	0.00
15. Jute and prod.	0	0.00	0	0.00	0	0.00	0	0.00
16. Rubber	5	0.80	0	0.00	0	0.00	1	3.50
17. Palm	1	1.00	0	0.00	0	0.00	0	0.00
18. Beverages	1	1.00	0	0.00	3	7.54	2	4.25
19. Grocery	5	0.85	0	0.00	1	12.00	1	7.00
20. Live stock	1	1.00	0	0.00	0	0.00	0	0.00
21. Fish	6	0.75	0	0.00	1	10.00	1	7.00
22. Ferti.& Ani.Feed	1	1.00	0	0.00	0	0.00	2	1.50
23. Household App.	2	0.63	0	0.00	1	4.80	1	3.50
24. Other manufac.	3	0.92	0	0.00	0	0.00	0	0.00
25. All others	5	0.55	0	0.00	5	8.23	7	4.39
26. Unidentified	0	0.00	0	0.00	0	0.00	0	0.00
Total	42	0.81	0	0.00	16	8.29	37	5.46

Table A5-5 LOADED FACTORS BY CARGO AND VEHICLE TYPE (CON'T)

Loaded Factors by Cargo and Vehicle Type: Overall

Cargo\Vehicle	Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck	
	Number	Average	Number	Average	Number	Average	Number	Average
1. Rice	1	0.00	1	0.93	2	4.70	10	6.50
2. Sand, Gravel	2	0.88	5	2.26	26	8.25	48	7.68
3. Cement and prod.	1	0.75	0	0.00	7	7.93	24	7.52
4. Steel	3	0.58	1	1.85	2	2.33	7	5.25
5. Constructn mat.	9	0.72	1	0.93	11	8.38	13	6.82
6. Timber	5	0.85	1	0.10	16	8.26	32	7.48
7. Firewood	1	0.75	0	0.00	1	0.00	2	0.00
8. Petroleum prod.	15	0.75	1	0.00	8	7.21	92	7.51
9. Minerals	0	0.00	0	0.00	1	0.00	41	8.37
10. Vegetable, Fruit	48	0.70	0	0.00	11	8.07	12	6.06
11. Cassava	2	0.75	0	0.00	0	0.00	0	0.00
12. Maize	0	0.00	0	0.00	0	0.00	0	0.00
13. Sugar cane	1	0.00	0	0.00	0	0.00	0	0.00
14. Bean	0	0.00	0	0.00	0	0.00	0	0.00
15. Jute and prod.	0	0.00	0	0.00	0	0.00	0	0.00
16. Rubber	21	0.80	0	0.00	7	6.73	30	6.55
17. Palm	5	0.80	0	0.00	8	8.25	19	6.44
18. Beverages	17	0.82	1	0.00	12	8.78	10	7.39
19. Grocery	19	0.63	2	2.78	4	5.90	5	5.08
20. Live stock	6	0.90	2	0.31	8	5.37	10	6.35
21. Fish	18	0.78	1	0.00	9	8.20	19	7.09
22. Ferti.& Ani.Feed	7	0.89	1	0.15	3	5.63	15	6.39
23. Household App.	8	0.69	0	0.00	5	5.86	4	8.49
24. Other manufac.	18	0.64	2	3.24	4	7.62	2	7.06
25. All others	42	0.65	2	1.85	34	7.03	30	6.49
26. Unidentified	0	0.00	0	0.00	0	0.00	1	7.00
Total	249	0.72	21	1.50	179	7.43	425	7.17

Table A5-5 LOADED FACTORS BY CARGO AND VEHICLE TYPE (CON'T)

Loaded Factors by Cargo and Vehicle Type: Station 00-6

Cargo\Vehicle	Pickup (Cargo)		4W-Truck		6W-Truck		10W-Truck	
	Number	Average	Number	Average	Number	Average	Number	Average
1. Rice	0	0.00	0	0.00	0	0.00	0	0.00
2. Sand, Gravel	0	0.00	0	0.00	0	0.00	0	0.00
3. Cement and prod.	0	0.00	0	0.00	0	0.00	0	0.00
4. Steel	0	0.00	0	0.00	0	0.00	0	0.00
5. Constructn mat.	0	0.00	0	0.00	0	0.00	0	0.00
6. Timber	1	0.75	0	0.00	2	4.80	3	8.67
7. Firewood	0	0.00	0	0.00	1	10.00	0	0.00
8. Petroleum prod.	0	0.00	0	0.00	0	0.00	1	9.50
9. Minerals	0	0.00	0	0.00	0	0.00	0	0.00
10. Vegetable, Fruit	2	0.63	0	0.00	1	2.50	1	9.50
11. Cassava	0	0.00	0	0.00	0	0.00	0	0.00
12. Maize	0	0.00	0	0.00	0	0.00	0	0.00
13. Sugar cane	0	0.00	0	0.00	0	0.00	0	0.00
14. Bean	0	0.00	0	0.00	0	0.00	0	0.00
15. Jute and prod.	0	0.00	0	0.00	0	0.00	0	0.00
16. Rubber	0	0.00	0	0.00	0	0.00	4	9.75
17. Palm	0	0.00	0	0.00	0	0.00	0	0.00
18. Beverages	0	0.00	0	0.00	0	0.00	1	10.50
19. Grocery	2	0.25	0	0.00	0	0.00	1	2.63
20. Live stock	1	1.00	0	0.00	2	6.00	0	0.00
21. Fish	3	0.92	0	0.00	1	10.00	0	0.00
22. Ferti.& Ani.Feed	0	0.00	0	0.00	0	0.00	0	0.00
23. Household App.	0	0.00	0	0.00	0	0.00	0	0.00
24. Other manufac.	3	0.50	0	0.00	1	10.00	0	0.00
25. All others	2	0.50	0	0.00	0	0.00	0	0.00
26. Unidentified	0	0.00	0	0.00	0	0.00	0	0.00
Total	14	0.63	0	0.00	8	6.76	11	8.83

Table A5-6 HOURLY TRAFFIC VOLUME BY COUNT STATION

1.1 Station C-1
: Inbound

Time\ Veh. Type* 1	2	3	4	5	6	7	8	9	10	
06:00-07:00	4	50	1	1	25	4	0	13	34	89
07:00-08:00	25	91	9	1	180	26	1	22	40	428
08:00-09:00	21	63	5	3	112	41	2	19	34	162
09:00-10:00	31	39	1	4	105	31	1	24	33	134
10:00-11:00	22	33	2	7	122	58	3	13	34	118
11:00-12:00	26	36	1	4	118	40	1	16	47	104
12:00-13:00	23	22	2	4	109	39	0	18	35	115
13:00-14:00	23	43	1	4	137	39	1	35	33	113
14:00-15:00	18	25	5	7	94	31	3	18	36	89
15:00-16:00	25	27	2	1	98	55	5	18	31	120
16:00-17:00	16	32	1	7	123	34	3	31	31	139
17:00-18:00	41	30	2	9	136	32	3	19	38	146
18:00-19:00	28	17	0	12	119	28	4	28	31	141
19:00-20:00	14	25	0	6	86	41	2	7	32	88
20:00-21:00	10	10	0	7	90	13	1	12	36	97
21:00-22:00	0	7	0	1	48	12	0	5	29	52
22:00-23:00	5	6	0	1	33	8	0	5	28	27
23:00-24:00	3	2	0	0	41	12	1	7	19	19
24:00-01:00	1	4	0	0	16	5	1	9	45	10
01:00-02:00	2	3	0	0	12	7	1	6	53	6
02:00-03:00	0	4	0	0	9	8	0	2	15	20
03:00-04:00	1	3	0	0	13	4	0	2	31	9
04:00-05:00	1	5	0	0	13	8	0	0	40	18
05:00-06:00	2	5	0	1	11	6	0	2	16	13
24 Hrs.	342	582	32	80	1850	582	33	331	801	2257

1.2 Station C-1
: Outbound

Time\ Veh. Type* 1	2	3	4	5	6	7	8	9	10	
06:00-07:00	12	17	1	13	45	21	0	17	50	71
07:00-08:00	13	32	3	7	71	25	1	24	28	137
08:00-09:00	17	39	1	7	116	44	1	26	32	157
09:00-10:00	27	35	2	2	128	39	3	32	49	127
10:00-11:00	34	50	4	5	127	60	2	23	47	118
11:00-12:00	22	45	1	4	96	66	7	28	36	124
12:00-13:00	23	42	3	5	96	52	3	20	34	117
13:00-14:00	21	35	1	4	113	61	2	27	30	89
14:00-15:00	29	27	1	3	111	30	2	14	35	112
15:00-16:00	30	43	1	6	130	48	1	24	36	141
16:00-17:00	25	66	4	5	127	58	8	19	42	187
17:00-18:00	29	54	1	0	147	62	1	29	38	312
18:00-19:00	15	31	0	1	98	37	1	16	27	208
19:00-20:00	17	21	0	1	77	10	2	10	36	108
20:00-21:00	9	15	0	0	66	11	0	9	33	70
21:00-22:00	8	10	0	0	52	10	0	13	38	60
22:00-23:00	4	22	0	0	42	8	2	8	27	51
23:00-24:00	2	1	0	0	31	9	0	5	21	28
24:00-01:00	0	1	0	0	17	12	0	5	32	35
01:00-02:00	0	2	0	0	16	4	0	6	19	15
02:00-03:00	1	2	1	1	12	7	0	2	20	9
03:00-04:00	1	3	0	3	16	10	0	6	27	12
04:00-05:00	3	4	0	3	15	6	0	6	21	9
05:00-06:00	6	4	0	7	18	13	0	12	32	21
24 Hrs.	348	601	24	77	1767	703	36	381	790	2318

* The vehicle types are conformable with Fig. A5-2.

Table A5-6 HOURLY TRAFFIC VOLUME BY COUNT STATION (CON'T)

2.1 Station C-2
: Inbound

Time\ Veh. Type* 1	2	3	4	5	6	7	8	9	10	
06:00-07:00	3	4	0	0	5	5	0	1	25	14
07:00-08:00	6	7	0	1	9	9	0	1	13	22
08:00-09:00	7	7	0	0	11	12	0	4	12	11
09:00-10:00	4	2	0	0	28	13	0	10	18	14
10:00-11:00	4	7	0	0	22	10	1	1	12	13
11:00-12:00	6	7	0	0	23	6	0	2	18	23
12:00-13:00	5	8	0	0	26	8	0	2	20	13
13:00-14:00	7	2	0	1	18	8	0	2	6	8
14:00-15:00	6	2	0	0	27	11	0	0	14	15
15:00-16:00	8	11	1	0	31	7	0	5	10	17
16:00-17:00	11	8	0	0	13	23	0	3	13	11
17:00-18:00	5	4	0	0	13	13	0	0	13	13
12 Hrs.	72	69	1	2	226	125	1	31	174	174

3.1 Station C-3
: Inbound

Time\ Veh. Type* 1	2	3	4	5	6	7	8	9	10	
06:00-07:00	1	0	1	1	2	0	0	1	7	10
07:00-08:00	1	0	0	1	4	1	0	1	0	16
08:00-09:00	0	1	1	1	5	2	0	1	3	28
09:00-10:00	0	0	1	0	14	1	0	1	1	26
10:00-11:00	1	0	0	0	7	1	0	2	6	25
11:00-12:00	0	0	0	0	3	2	0	1	4	20
12:00-13:00	1	1	1	1	6	3	0	1	2	11
13:00-14:00	1	1	0	0	4	3	0	4	2	16
14:00-15:00	1	1	2	2	4	1	0	3	7	17
15:00-16:00	1	0	1	0	8	3	0	1	2	16
16:00-17:00	1	0	0	0	3	0	0	2	8	16
17:00-18:00	2	1	2	0	8	4	0	0	15	32
12 Hrs.	10	5	9	6	68	21	0	18	57	233

2.2 Station C-2
: Outbound

Time\ Veh. Type* 1	2	3	4	5	6	7	8	9	10	
06:00-07:00	11	12	0	0	7	5	0	1	11	10
07:00-08:00	9	16	0	0	14	4	0	2	3	15
08:00-09:00	7	6	0	0	32	7	0	2	20	11
09:00-10:00	5	5	0	0	21	5	0	3	37	19
10:00-11:00	7	5	0	2	28	9	0	5	26	16
11:00-12:00	5	8	0	0	29	8	0	3	20	17
12:00-13:00	2	6	0	0	15	8	0	7	6	14
13:00-14:00	5	10	0	0	21	6	0	4	24	13
14:00-15:00	3	6	0	0	24	10	0	8	16	11
15:00-16:00	5	5	0	0	13	11	0	4	8	32
16:00-17:00	3	9	0	0	30	2	0	4	8	15
17:00-18:00	4	5	0	1	30	9	1	2	8	24
12 Hrs.	66	93	0	3	264	84	1	45	187	197

3.2 Station C-3
: Outbound

Time\ Veh. Type* 1	2	3	4	5	6	7	8	9	10	
06:00-07:00	0	1	5	0	9	0	0	1	1	10
07:00-08:00	0	0	1	0	2	1	0	0	3	28
08:00-09:00	0	0	0	0	2	1	0	1	5	18
09:00-10:00	0	1	0	0	5	1	0	1	3	17
10:00-11:00	1	0	0	0	3	2	0	1	1	13
11:00-12:00	1	1	1	1	6	2	0	0	6	17
12:00-13:00	1	0	0	0	3	3	0	2	5	16
13:00-14:00	1	0	0	0	4	2	0	2	8	16
14:00-15:00	0	0	0	2	6	3	0	1	8	14
15:00-16:00	0	0	1	0	2	0	2	0	5	23
16:00-17:00	0	0	0	1	1	3	0	0	2	21
17:00-18:00	1	0	1	0	3	2	0	0	2	27
12 Hrs.	5	3	9	4	46	22	0	11	49	220

Table A5-6 HOURLY TRAFFIC VOLUME BY COUNT STATION (CON'T)

4.1 Station C-4
: Inbound

Time\Veh.Type* 1	2	3	4	5	6	7	8	9	10
06:00-07:00	3	0	4	2	5	0	5	3	4
07:00-08:00	4	1	7	15	1	0	4	4	4
08:00-09:00	5	2	3	5	21	5	1	2	3
09:00-10:00	7	3	1	8	40	4	0	3	24
10:00-11:00	15	1	3	7	27	10	0	4	29
11:00-12:00	14	3	5	45	17	0	5	3	20
12:00-13:00	9	6	5	6	28	15	1	10	17
13:00-14:00	14	1	3	8	25	12	1	9	6
14:00-15:00	12	2	2	5	29	7	0	3	5
15:00-16:00	19	2	2	6	30	9	1	5	14
16:00-17:00	7	1	1	3	44	7	0	8	9
17:00-18:00	10	2	2	6	32	10	0	7	10
18:00-19:00	8	0	0	2	36	6	1	3	6
19:00-20:00	7	1	1	1	28	5	0	3	4
20:00-21:00	6	0	0	0	14	3	0	5	6
21:00-22:00	1	0	0	0	11	2	1	3	6
22:00-23:00	1	0	0	0	5	0	0	0	14
23:00-24:00	1	0	0	0	8	2	0	1	16
24:00-01:00	0	0	0	0	6	0	0	2	17
01:00-02:00	0	0	0	0	6	0	0	2	1
02:00-03:00	0	0	0	0	2	2	0	0	7
03:00-04:00	0	0	0	0	1	1	0	1	2
04:00-05:00	0	0	0	0	1	2	0	1	2
05:00-06:00	1	0	0	1	5	5	0	3	1
24 Hrs.	144	25	27	74	461	130	6	89	169
									322

4.2 Station C-4
: Outbound

Time\Veh.Type* 1	2	3	4	5	6	7	8	9	10
06:00-07:00	3	1	0	2	12	3	1	2	3
07:00-08:00	7	0	1	4	11	3	0	6	5
08:00-09:00	4	1	0	6	27	2	0	7	16
09:00-10:00	9	3	1	6	43	8	1	12	3
10:00-11:00	12	3	1	4	42	8	0	6	2
11:00-12:00	12	1	4	6	37	1	1	3	7
12:00-13:00	7	0	2	4	35	12	0	11	4
13:00-14:00	3	1	5	8	28	10	0	4	5
14:00-15:00	13	3	2	5	41	8	0	6	10
15:00-16:00	7	1	4	6	44	7	0	3	13
16:00-17:00	13	1	3	6	42	7	1	3	5
17:00-18:00	7	1	3	6	22	8	0	6	4
18:00-19:00	5	1	1	0	24	9	0	2	7
19:00-20:00	9	1	0	0	23	5	2	0	10
20:00-21:00	2	0	0	0	17	3	0	2	3
21:00-22:00	2	1	0	0	8	0	0	4	0
22:00-23:00	1	2	0	0	6	1	0	0	3
23:00-24:00	0	1	0	0	9	1	0	1	2
24:00-01:00	0	0	0	0	6	0	0	0	1
01:00-02:00	0	0	0	0	3	1	0	0	17
02:00-03:00	0	0	0	0	3	1	0	1	13
03:00-04:00	0	0	0	0	2	0	0	1	17
04:00-05:00	1	0	0	0	0	0	0	2	5
05:00-06:00	1	0	0	1	3	2	0	1	3
24 Hrs.	118	22	27	64	488	100	6	83	149
									313

Table A5-6 HOURLY TRAFFIC VOLUME BY COUNT STATION (CON'T)

5.1 Station C-5
: Inbound

Time\Veh.Type* 1	2	3	4	5	6	7	8	9	10
06:00-07:00	0	0	0	4	1	0	0	0	22
07:00-08:00	0	9	2	0	9	1	0	3	1
08:00-09:00	0	3	0	1	7	1	0	4	2
09:00-10:00	0	7	0	0	10	6	0	1	15
10:00-11:00	2	3	0	1	7	5	0	2	7
11:00-12:00	0	2	1	0	9	11	1	4	8
12:00-13:00	0	4	0	0	5	3	3	2	3
13:00-14:00	0	3	0	0	3	2	0	2	7
14:00-15:00	2	5	1	0	8	4	0	1	1
15:00-16:00	0	2	1	1	12	1	1	5	27
16:00-17:00	1	2	0	0	13	1	1	0	40
17:00-18:00	2	1	1	0	11	2	0	1	8
12 Hrs.	7	41	6	3	98	38	6	25	65
									267

5.2 Station C-5
: Outbound

Time\Veh.Type* 1	2	3	4	5	6	7	8	9	10
06:00-07:00	0	0	0	0	2	0	0	0	2
07:00-08:00	0	2	0	1	12	4	1	0	7
08:00-09:00	1	4	1	0	17	1	1	1	3
09:00-10:00	0	3	0	0	11	3	0	1	3
10:00-11:00	0	3	0	0	5	0	0	3	14
11:00-12:00	1	3	0	0	5	3	0	1	10
12:00-13:00	1	3	0	0	12	1	1	1	12
13:00-14:00	0	3	0	1	13	1	0	4	8
14:00-15:00	0	6	0	0	3	3	0	5	6
15:00-16:00	0	3	0	0	5	2	0	4	6
16:00-17:00	1	9	3	1	10	2	0	3	2
17:00-18:00	0	1	0	0	9	0	0	0	8
12 Hrs.	4	40	4	3	104	22	3	23	70
									252

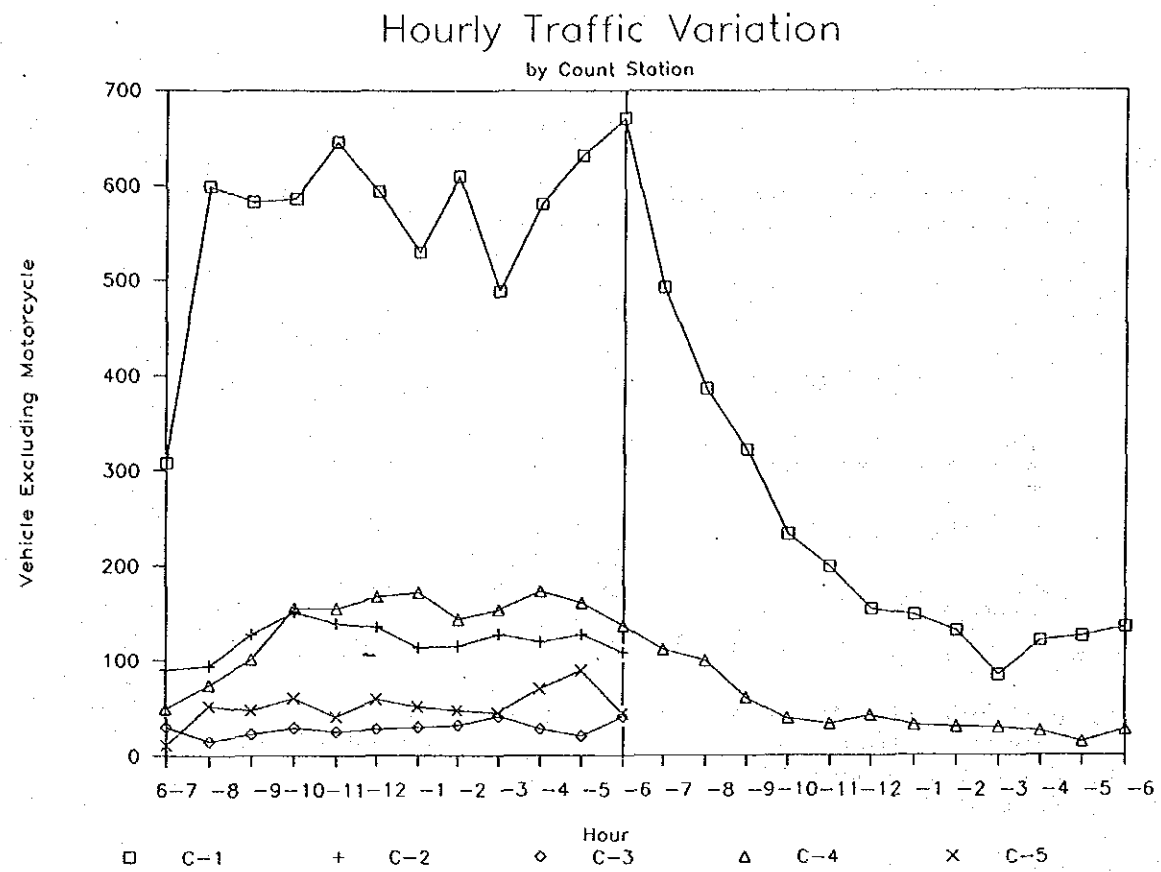


Fig. A5-6 TRAFFIC VARIATION

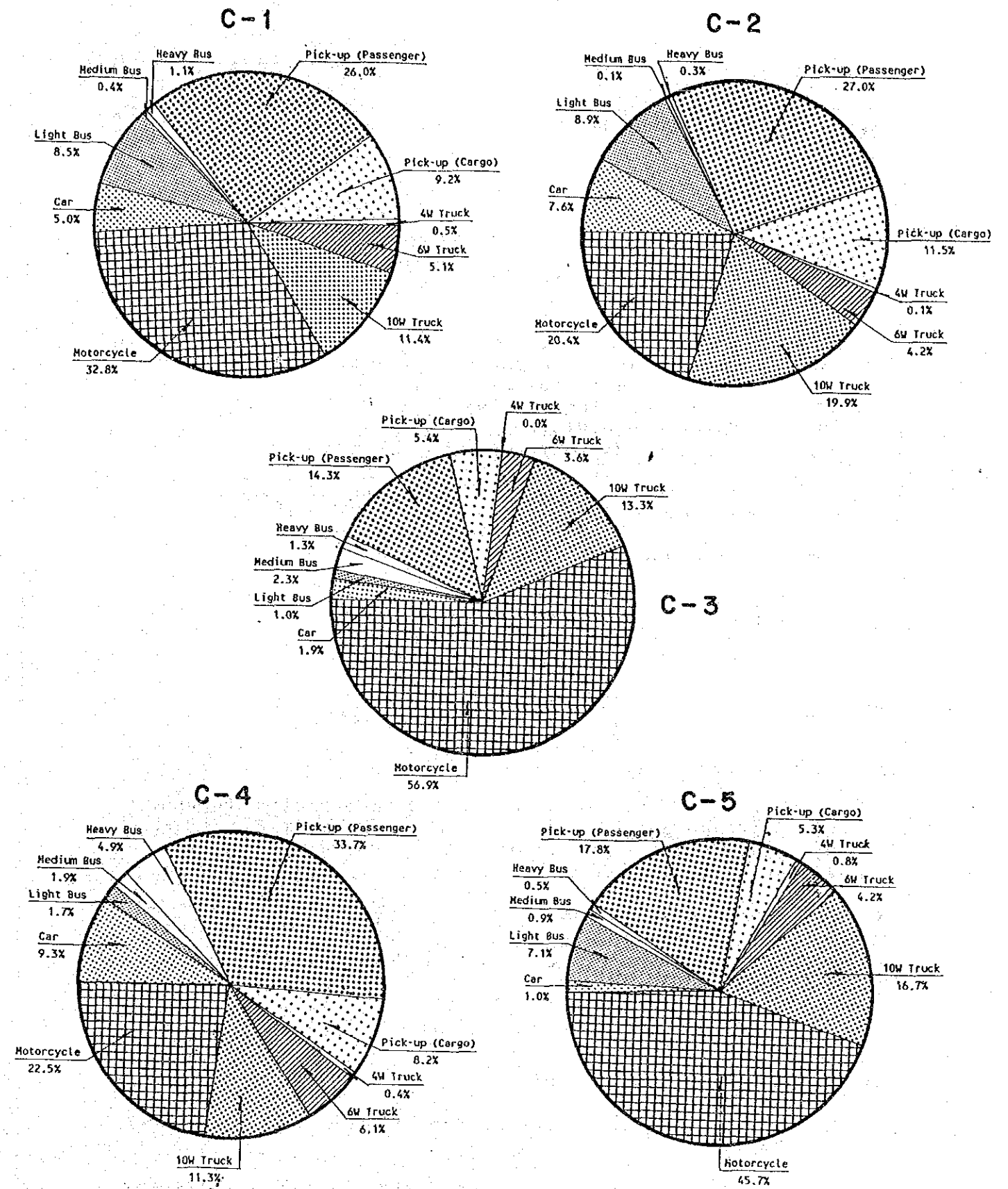


Fig. A5-5 TRAFFIC COMPOSITION

A6 Present Road Network

1. Data Items of Inventory

RN : Route Name
 CSSN : Control Section - Subsection
 LCS : Length of Control Section (m)
 FCC : Functional Class Code
 ST : Surface Type
 PC : Pavement Condition
 WP : Width of Pavement (cm)
 TWROW : Total Width of Right of Way (cm)
 ADT : Average Daily Traffic
 HV : Heavy Vehicles per Day
 MH : Maintenance History
 DHL : Disaster History Level

2. Numerical Code

1) Functional Class Code (FCC)

10; Pd	20; Sd	30; Fd
11; P1	21; S1	31; F1
12; P2	22; S2	32; F2
13; P3	23; S3	33; F3
	24; S4	34; F4
	25; S5	35; F5
		36; F6

2) Surface Type (ST)

1; Earth	5; Under STD Penetration Macadam
2; Soil Aggregate	6; Penetration Macadam
3; Single S.T.	7; Asphaltic Concrete
4; Double S.T.	8; Concrete

3) Pavement Condition (PC)

1; Good
 2; Good/Fair
 3; Fair
 4; Fair/Poor
 5; Poor

4) Maintenance History (MH)

A; On-going projects for construction as of September 1987.
 B; Projects committed in the Sixth Five-Year Highway Plan (1987 - 1991),
 BR; Reconstruction/Rehabilitation/New construction.
 BB; Upgrading to Bitumen surfaced road.

C; Projects planned in 1989-1991 in the Sixth Five-Year Highway Plan,
 CR; Reconstruction/Rehabilitation/New construction.
 CB; Upgrading to Bitumen surfaced road.

D; Soil aggregate surfaced road.

E; Additional two-lane construction committed in the Sixth Five-Year Highway Plan.

F; Additional two-lane construction planned in the 1989-1991 Sixth Five-Year Plan.

G; Road links rehabilitated in the last 3 years.

H; Road links planned as Concession Highway.

5) Disaster History Level (DHL)

3; Damaged almost more than once a every year
 2; Damaged almost more than once a every three years
 1; Damaged in the past
 0; No damage

3. Road List and Road Map

Nakhon Si Thammarat	: 34 links	612,178 m
Krabi	: 31	587,801
Surat Thani	: 47	787,354
Thung Song	: 37	658,013

Table A6-2 ROAD INVENTORY DATA (DISTRICT KRABI)

RN	CSSN	RNM	LCS	FCC	ST	PC	WP	TWROW	ADT	HV	MH	DHL
4	3200	A. THAP PUT - T. TO A. AO LUK	20600	13	6	3	600	5000	1535	372		2
4	3300	J. TO A. AO LUK - J. TO C. KRABI	39900	13	6	3	600	5000	1963	462		0
4	3400	J. TO C. KRABI - J. TO B. LUN THAP	36200	13	3	3	600	4000	4113	993		0
4	3500	J. TO BAN LUM THAP - C. TRANG C. KRABI BOUNDARIES	32170	13	6	2	600	4000	1513	434		0
411	100	J. TO C. KRABI - KM. 4+300	4300	23	5	1	600	3000	7034	621	CR	0
416	100	J. R. 401 (PHA NOM) - KHAO TO (DIST. KRABI)	37500	34	4	1	500	4000	374	135	CB	0
416	200	KHAO TO (BAN BANG KHLAM) CONT. C. SURATTANI DIST. - ROUTE 4 - BANPAKLAO	15200	34	4	2	500	5500	497	160		1
4033	100	J. ROUTE 4 (KM. 116+300) - J. TO BAN NAI SA	5310	36	2	3	600	3000	447	149		0
4034	100	PAKNAN KRABI - BAN KHAO THONG	25260	34	4	1	500	3000	1301	288	CB	0
4035	100	J. ROUTE 4 (AO LUK) - BAN PLAIPHARA YA	20612	34	4	3	500	4000	974	156		0
4035	200	BAN PLAI PHARAYA - AMPHOE PHARA SAENG	44688	34	4	3	500	4000	3264	600		0
4036	100	J. ROUTE 4 (BAN NUA KHLONG) - BAN LEAM KRUCAT	22900	34	4	4	500	3000	422	36		0
4037	100	J. ROUTE 4 (NUA KHLONG) - BAN SONG PLEAK	34700	34	4	4	600	3000	986	270		3
4037	200	BAN SONG PLEAK - ROUTE 4035 (BAN KUAN SAWANG)	24024	34	4	4	500	4000	530	100		3
4038	100	J. ROUTE 4 (BAN KHLONG TOM TAI) - BAN LUMTHAP (CONTINUE THUNGSONG	27000	36	2	1	600	3000	364	109	CB	1
4038	200	LAMTHAP - THUNG YAI	26870	36	2	3	700	3000	180	11		1
4039	100	J. ROUTE 1 - A. AO LUK - BAN LEAM SAK	17900	36	2	3	600	3000	298	35		0
4041	100	J. ROUTE 4 (BAN BANG PHUNG) - BAN KHOK YANG	4293	36	2	1	600	3000	95	18		0
4042	100	J. ROUTE 4 (BAN SAI KHAO) - BAN BO MUANG	13250	36	2	1	620	3000	380	72	CB	0
4043	100	J. ROUTE 4 (BAN KHLONG PHON) - BAN NAM TOR - BAN TAMAPRAOW	13210	36	2	4	600	3000	347	50		0
4118	100	J. ROUTE 4 (A. THAP PCT) - KM. 19+000	19000	36	2	4	600	3000	177	12		0
4156	100	KHAO PHANOM - THUNG YAI	40820	34	4	3	550	4000	557	177		3
4197	100	J. ROUTE 4010 (KHAO TO) - ROUTE 4035 (BAN PLAI PHARAYA)	15938	34	4	2	500	4000	1106	246		0
4200	101	J. ROUTE 4034 - ROUTE 4	2535	34	4	3	500	3000	1541	357		0
4200	102	J. ROUTE 4200 CONTROL SECTION 0101 - ROUTE 4	396	34	4	3	500	3000	1511	357		0
4201	100	BAN CHONG PREE - AO PHARA NANG	3465	36	2	4	600	3000	186	13		0
4202	100	J. ROUTE 4034 (BAN CHONG PREE) - NOPARATTHALA BEACH	5162	34	4	3	500	3000	618	20		0
4203	100	7500000YEARS FOSSIL OF SHELL - AO PHARA NANG	8376	36	2	4	600	3000	472	35		0
4204	100	J. ROUTE 4034 (BAN SAI THAI) - 7500000YEARS FOSSIL OF SHELL	8180	36	2	4	600	3000	311	16		0
4205	100	J. ROUTE 4 (AO LUK NOI) - BAN BAGUN	7981	36	2	4	600	3000	298	12		0
4206	100	J. ROUTE 4 (HUAI NAY KAO) - BAN KHLONG YAO	10061	36	2	4	600	3000	438	249		0
Total										587801		

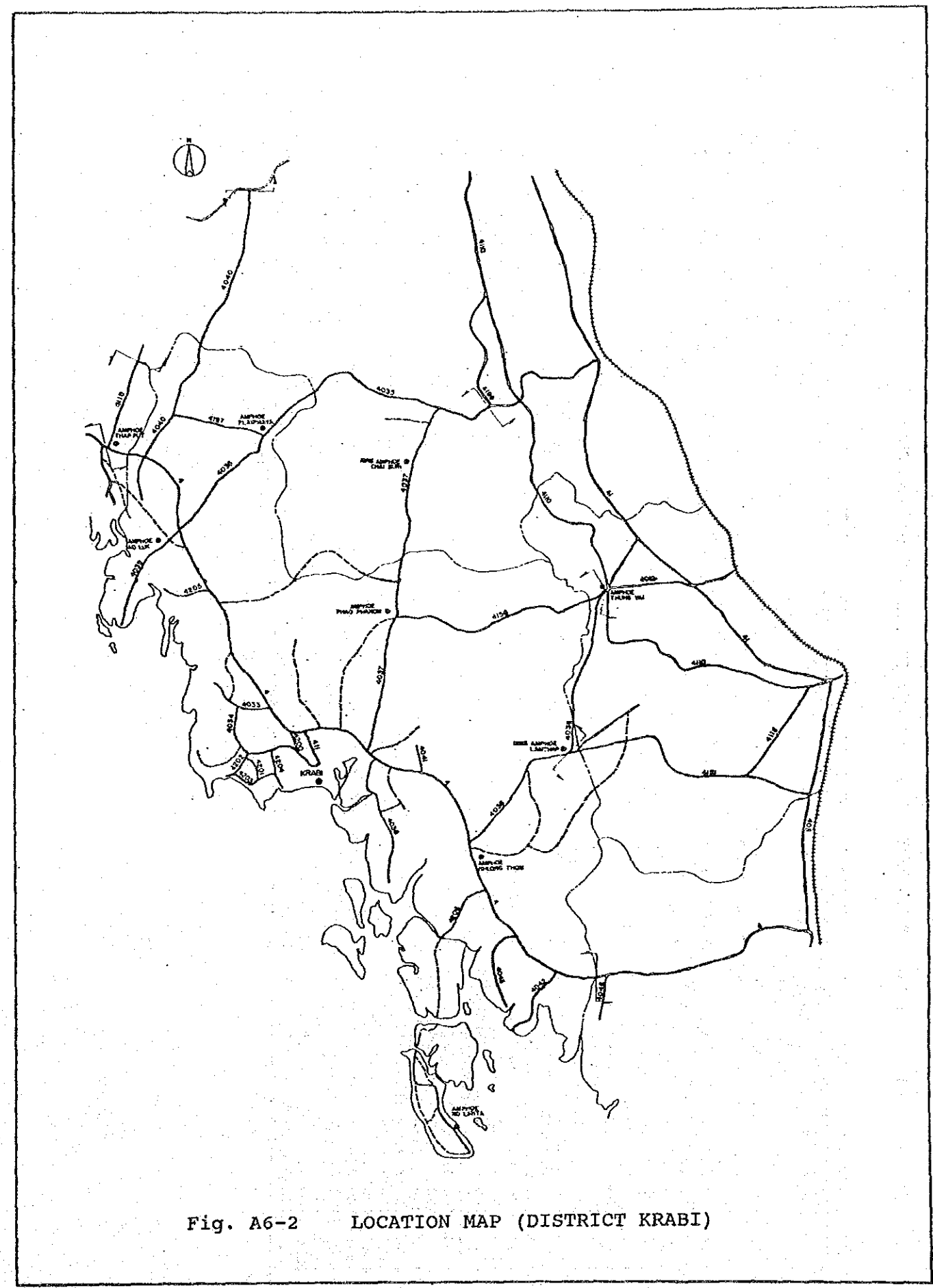
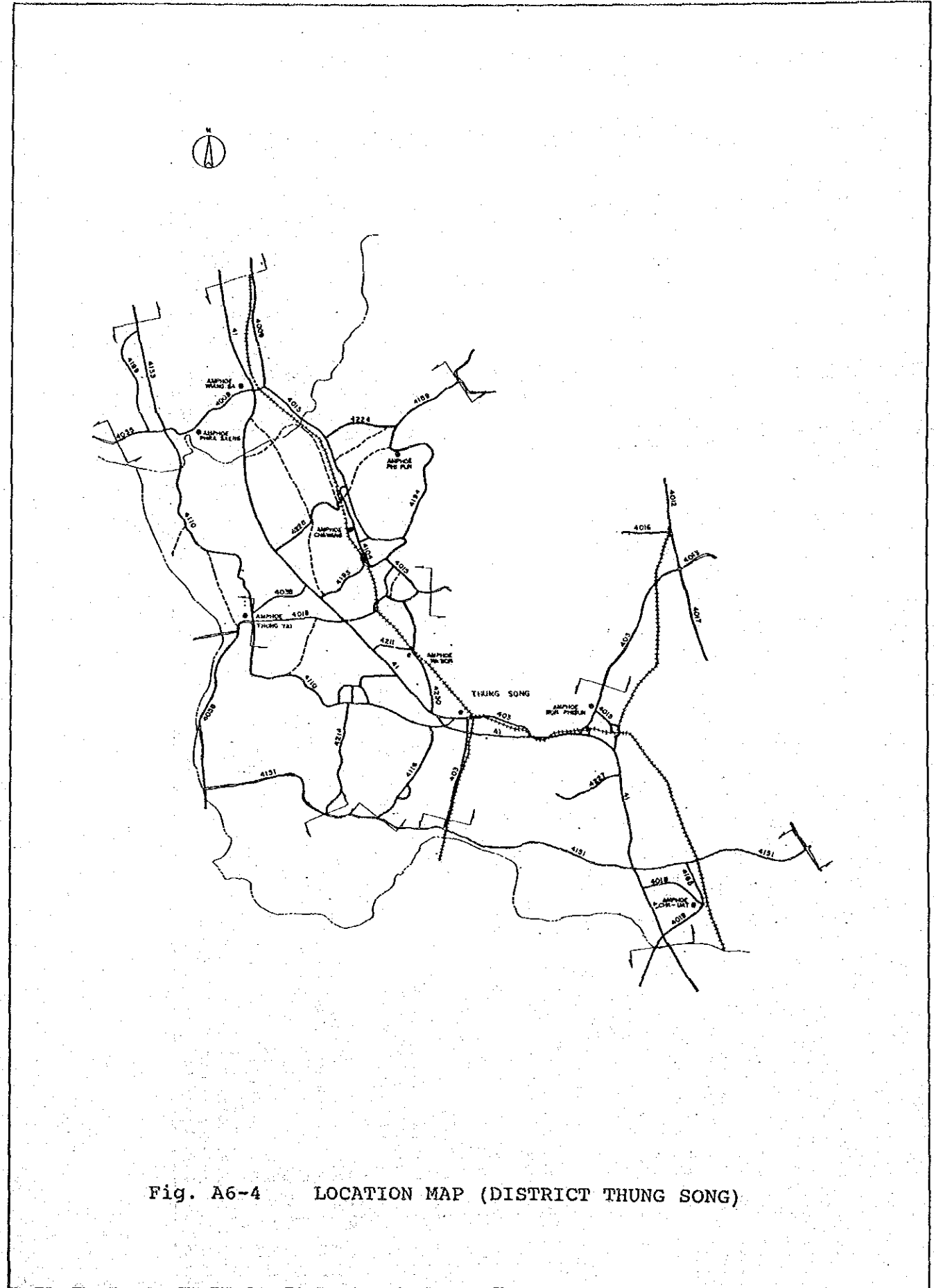


Fig. A6-2 LOCATION MAP (DISTRICT KRABI)

Table A6-4 ROAD INVENTORY DATA (DISTRICT THUNG SONG)

RN	CSSN	RNM	LCS	FCC	ST	PC	WP	TWROW	ADT	HV	MH	DHL
41	702	KM. 153+000(DIST. SURATHANI) - WIANG SRA	15636	12	7	2	650	8000	2879	1309		0
41	800	WIANG SRA - CHAWANG	15918	12	7	2	650	8000	3544	1310		2
41	900	CHAWANG - PAK PRAK MUNICIPAL	54853	12	7	2	650	8000	5013	1866		3
41	1001	THUNG SONG - RON PHIBUN	20373	11	7	1	700	8000	5535	1510		3
41	1002	RON PHIBUN - THA PRACHA(DIST. PHATTHALUNG)	34310	12	7	2	650	8000	2703	989		3
403	103	RON PHIBUN(DIST. NAKHON SI THAMMARAT) - R. 41	6130	21	7	1	700	3000	3800	975		2
403	200	J.R. 41 - THUNG SONG	7292	23	5	1	600	4000	1219	302	CR	1
403	301	THUNG SONG - KA PANG(DIST. TRANG)	16385	23	7	2	600	6000	4074	1101		0
4009	201	BAN NASAN - BANSON	17069	34	4	3	500	3000	2719	788	CR	3
4009	202	BANSON - PHRA SAENG	18423	34	4	1	500	3000	2719	788	CR	3
4009	300	PHRA SAENG - R. 4035	2748	34	4	2	500	4000	2477	656		2
4015	202	CHAN DI(DIST. NAKHON SI THAMMARAT) - CHAWANG	23536	34	4	3	500	3000	2056	220		3
4015	300	CHAWANG - BAN SONG	34784	34	4	3	500	3000	1289	225		3
4018	101	J.R. 403(RON PHIBUN) - KHAO CHUMTONG	4627	34	4	3	500	3000	805	180		3
4018	102	KHAO CHUMTONG - R.41(KHUAN KOEI)	6500	34	4	3	500	3000	253	49		3
4018	103	J.R. 41 (THUNG PO) - CHA UAT	11027	34	4	2	550	3000	705	143		3
4018	104	CHA UAT-THAPRACHA (DIST. PHATTHALUNG)	14950	34	4	3	500	2000	619	108		3
4019	100	THUNG YAI - LAK CHANG - CHAN DI	27449	34	4	0	500	3000	1449	330		3
4035	300	DISTRICT KRABI - PHAR SAENG	2600	34	4	3	500	4000	2489	755		0
4038	300	THUNG YAI - ROUTE NO.41	10584	36	2	1	700	3000	180	11	CB	0
4104	100	J.R. 4015(NA KHLIANG) - THANPHO RAILWAY STATION	6949	34	4	1	500	800	399	44		0
4110	101	THUNG SONG - THUNG YAI	48661	31	4	3	500	3000	309	66		2
4110	102	INTERSECTION - SAHAKON THUNG SONG	8937	23	7	0	600	0	383	44		0
4110	200	THUNG YAI - PHRA SAENG	42378	34	3	3	500	4000	332	71		3
4116	100	THUNG SONG - NAM RON	18203	35	2	5	300	4000	421	33		0
4133	200	ROUTE NO. 4133 BAN KUAN SANAKKI - PHARA SAENG	15000	35	4	1	900	0	431	165	CB	0
4151	100	J. TO R. 41 (DIST. NAKHON SI THAMMARAT) - R. NO. 41(DIST. TRANG)	28172	36	2	1	500	3000	357	126	CB	0
4165	100	J. TO R. NO.4151(BAN TUN) - REPURIC HELP CHA UAT	9280	36	4	3	800	2000	286	41		3
4180	100	J. TO R. NO.41 - PARUPRI	2310	34	7	0	550	0	411	13		0
4189	102	KN. 17+100(DIST. NAKHON SI THAMMARAT) - PHI PUN	16054	26	2	3	600	3000	118	4		0
4194	100	J.R. 4015(KHUAN SONG SAN) - PHI PUN	19307	34	3	3	500	3000	860	117		3
4195	100	J.R. 41 - SUKHAPHIBAN CHANDI	11600	34	4	1	500	3000	1330	291		3
4199	100	J. PHARA SAENG - BAN BANG YAI - BAN KUAN SANAKKI	18881	36	2	4	600	3000	74	209		8
4211	100	J.R. 41 - NABON	5997	34	4	1	550	3000	674	209		1
4214	100	J. TO R. NO.4110 - R.4151	22804	33	4	0	600	0	106	15		1
4224	100	PHIPUN - HUAI PRIK	20582	23	4	0	600	0	0	0		0
4228	100	THAN PHO STATION - R.41	17704	23	4	0	600	0	0	0		0
Total 658013												



A7 Planning Framework of the SSDP

1. PRODUCTION FRAMEWORK

1.1 Assumption

- 1) Per capita GRP of the Southern Region will be equal to the national average in 2011
- 2) Per Capita GRP of the Southern Region in 2001 will be equal to 87.5 % of the national average
- 3) Population net inflow in 2001 as 40,000 persons
- 4) Population net inflow in 2006 as 100,000 persons

1.2 Calculation

	PER CAPITA		ASSUMPTION WITH SSDP			
	NATIONAL (baht)	SOUTH (baht)	visavis NATIONAL	PER CAPITA (baht)	SOUTH GRP (billion)	SSDP (billion)
1988	26,364	21,057	-	-	144.47	-
1991	31,447	25,532	-	-	185.95	-
1996	39,805	32,837	-	-	262.63	-
2001	50,287	42,139	87.5 %	44,001	385.70	18.08
2006	63,532	53,585	93.5	59,402	567.65	60.95
2011	(80,266)	(68,140)	100.0			

1.3 Production and Population Framework of the SSDP

	PRODUCTION (billion)	POPULATION (thousand)
1988	-	-
1991	-	-
1996	-	-
2001	18.08 1/	40.0
2006	60.95 2/	100.0

Note: 1/ about 1.2 % and 12.5 % of National GDP and Southern GRP in 1988, respectively
 2/ about 4.2 % and 42.2 % of National GDP and Southern GRP in 1988, respectively

2. LOCATIONAL FRAMEWORK

2.1 Areal Assumption

	Industrial E.	Urban Center	Distribution C.
Krabi	Muang Krabi	Muang Krabi Ao Luk Khao Phanom	Muang Krabi
Khanom	Khanom Don Sak	Sichon Don Sak Kanchanadit	Khanom
Ban Na Doem		Ban Na San Muang Surat Phunphin Kanchanadit Kiang Sa	Ban Na Doem Ban Na San Muang Surat Phunphin

2.2 Framework Assumption

	Industrial E.	Urban Center	Distribution C.
Krabi	(30 %)	45 %	(15 %)
Khanom	(30 %)	45 %	(15 %)
Ban Na Doem		10 %	(10 %)

Note: 1) (xx %) shows percentage share of production
 2) xx % shows percentage share of population

2001	Industrial E. million baht	Distribution C. million baht	Urban Center population
Krabi	5,424	2,712	18,000
Khanom	5,424	2,712	18,000
Ban Na Doem		1,808	4,000
Total	10,848	7,232	40,000
		18,080	

2006	Industrial E. million baht	Distribution C. million baht	Urban Center population
Krabi	18,285	9,143	45,000
Khanom	18,285	9,143	45,000
Ban Na Doem		6,094	10,000
Total	36,570	24,380	100,000
		60,950	

A8 Traffic Demand Forecast

1. Zonal Framework of SSDP

The framework was broken down into the traffic zones for future transport demand forecast according to a location framework. The results are summarized in Table A8-1.

Table A8-1 GRP and Population Increase by SSDP

Zone No.	Zone Name	GRP (million Baht)		Population (person)	
		2001	2006	2001	2006
27	Krabi	8,136	27,428	14,400	36,000
28	Ao Luk	-	-	1,800	4,500
29	Khao Phanom	-	-	1,800	4,500
33	Tha Sala	-	-	1,800	4,500
34	Khanom	7,051	23,771	12,600	31,500
7	Surat Thani	542	1,828	1,200	3,000
8	Phun Phin	542	1,828	1,200	3,000
9	Khian Sa	-	-	400	1,000
10	Ban Na San	724	2,438	400	1,000
16	Knacanadit	-	-	2,600	6,500
17	Don Sak	1,085	3,657	1,800	4,500
Total		18,080	65,950	40,000	100,000

2. Expected Industries and Production

2.1 Expected Industries

"SOUTHERN SEABOARD DEVELOPMENT PROGRAM", issued by the Office of the Southern Seaboard Development Committee and the Office of the National Economic and Social Development Board in May 1990, described future expected industries in the SSDP area.

They are:

- Krabi : Oil refinery/oil related industries
: Tank farm
: Agro-industries
- Khanom : Gas separation plant, petrochemical, gas-related industries
: Oil-related industries
: Tank farm
: Agro-industries
: Trade and business center
- Near Ban Na San : Distribution center

The study team classified the expected industries into five. They are distribution/business industries, gas/oil related industries, agro-industries, other industries and trade industries. Distribution of these industries by zone are shown in Table A8-2.

Table A8-2 Location of Industries

Zone No.	Zone Name	Industries				
		Distribution	Gas/Oil	Agro	Others	Trade
27	Krabi	x	x	x	x	x
28	Ao Luk	-	-	-	-	-
29	Khao Phanom	-	-	-	-	-
33	Tha Sala	-	-	-	-	-
34	Khanom	x	x	x	x	x
7	Surat Thani	x	-	-	-	-
8	Phun Phin	x	-	-	-	-
9	Khian Sa	-	-	-	-	-
10	Ban Na San	x	-	-	-	-
16	Knacanadit	-	-	-	-	-
17	Don Sak	-	x	x	x	x

The distribution centers were assumed to locate at Krabi, Khanom, Surat Thani, Phun Phin and Ban Na San. Other industries which would be encouraged to be developed by the SSDP were assumed to locate at Krabi, Khanom and Don Sak zones.

2.2 Production Scale

Production scale was estimated for three types of industries to calculate expected volume of freight. They are gas/oil, agro and other industries. Cargo flow generated by distribution and the trade industries were not taken into account at the moment due to the extreme uncertainty. The estimation steps are shown below:

- A. Necessary production in terms of producer's price was estimated to achieve the increased GRP. Purchase from the other industries was assumed to 70% of the price.
- B. The production by the traffic zone were divided into the four industries assuming production shares are 50%, 20%, 10% and 20% for gas/oil related, trade/business, agro and other industries respectively.
- C. The production was converted into metric tons referring prices per metric ton of major products by industry type.

The estimation results are summarized in Table A8-3. Traffic zones which were assumed to generate cargo flows were Krabi, Khanom and Don Sak. These zones were assumed to have gas/oil, agro and other industries, as described before.

Table A8-3 Future Production in Metric Tons
(thousand tons per year)

Zone No.	Zone Name	Year	
		2001	2006
27	Krabi		
	Gas/Oil related	904	3,048
	Agro-industries	74	250
34	Khanom		
	Gas/Oil related	723	2,438
	Agro-industries	59	200
17	Don Sak		
	Gas/Oil related	181	610
	Agro-industries	15	50
	Other industries	4	14

3. Input & Output Distribution of Industries

The industries developed by the SSDP will produce many kinds of output, consuming various types of input. These input and output flow will generate freight traffic demand in the Southern Region. The study team took up assumptions on these input and output distributions in the area as described below.

Production of industries developed by the SSDP needs input from other industries and/or other countries. The study team assumed the output volume is 80 % of the input volume of the industry.

The characteristics of the industries suggested in the SSDP report are seemed to be export-oriented. Then, the export share out of the outputs of the industries will be relatively higher compared with existing industries.

The input and output distribution area within Thailand was assumed to be limited to the Southern Region. Because the Central Region and the others will be catered for by the other industries located there.

As for the distribution center, which will be expected in Ban Na San, it was assumed that the center will work to distribute the inputs and outputs to and from domestic markets in the Southern Region. So, the inputs for the industries will be gathered to the center and supplied to the industries, while

the outputs from the industries will be gathered to the center and distributed to various consumers in the Region. The study team assumed that a half of the inputs and outputs of the industries will be transported via the center. The rest will be transported directly to and from the industrial areas.

Detailed assumptions on the distribution by zone are shown below.

3.1 Krabi

- Gas/oil related industries

Input

Import : 70 %
Within Thailand : 30 %

Output

Export : 60 %
Within Thailand : 40 %

The gas/oil related industries in Krabi will produce related products using crude oil imported from the Middle East. The industries also produce various petrochemical products consuming the products in the industrial complex. The input which will be supplied within Thailand means such products.

Major part of the output will be exported to the western part of Asia and to the Far East. Assumed share between them were 70 % and 30 % of total export respectively. The rest will be the input for the industries and also for the consumption of the area.

- Agro industries

Input

Import : -
Within Thailand : 100 %

Output

Export : 70 %
Within Thailand : 30 %

The input for the agro industries will be supplied within the Southern Region. Most of the output will be assumed to be exported. The shares of the export between the west and the Far East were assumed to be same as gas/oil industries.

- Other industries

Input

Import : 50 %
Within Thailand : 50 %

Output

Export : 70 %
Within Thailand : 30 %

The input for the other industries will be supplied by other countries and industries in Thailand. The export share of the output was assumed to 70 %. The shares of the export between both sides were assumed to be same as gas/oil industries.

3.2 Khanom

- Gas/oil related industries

Input

Import : -
Within Thailand : 100 %

Output

Export : 60 %
Within Thailand : 40 %

The input for the industries will be supplied directly from the Erawan field by a pipeline. At the same time, the products will be used in the industrial complex. Then, whole input will be supplied within Thailand.

Major part of the output will be exported to the Far East and the western part of Asia. The shares between them were assumed to 70 % and 30 % of total export volume respectively, in consideration with advantageous location of Khanom. The rest will be the input for the industries and also for the consumption of the area.

- Agro industries

Input

Import : -
Within Thailand : 100 %

Output

Export : 70 %
Within Thailand : 30 %

Assumptions were same as the Krabi case, except the export shares.

- Other industries

Input

Import : 50 %
Within Thailand : 50 %

Output

Export : 70 %
Within Thailand : 30 %

Assumptions were same as the Krabi case, except the export shares.

3.3 Don Sak

- Gas/oil related industries

Input

Import : -
Within Thailand : 100 %

Output

Export : 60 %
Within Thailand : 40 %

The gas/oil related industries in Don Sak will be a kind of supporting industries for Khanom area. The input for the production will be supplied from Khanom and the industries in Don Sak.

The output distribution will be same as Khanom.

- Agro industries

Input

Import : -
Within Thailand : 100 %

Output

Export : 70 %
Within Thailand : 30 %

The same assumptions as Khanom were adopted.

- Other industries

Input

Import : 50 %
Within Thailand : 50 %

Output

Export : 70 %
Within Thailand : 30 %

Assumptions were same as Khanom.

4. Freight Traffic in the Southern Region

Based on the assumptions described above, freight traffic flows on roads between zones in the Southern Region were calculated. Major assumptions for the calculation are as follows:

- A. Products of the gas/oil related industries will be transported by pipeline.
- B. The inputs and outputs from or to the domestic market will be distributed according to a gravity formula shown below.

$$T_{ij} = a * GRP_j * d_{ij}^{-b}$$

$$T_{ij} = G_i$$

$$T_{ij} = A_j$$

where, T_{ij} : freight traffic between i zone and j zone
 GRP_j : Gross Regional Products of j zone
 d_{ij} : road distance between i zone and j zone
 a, b : parameter (b was assumed to be 1.0)
 G_i : total freight volume generated at i zone
 A_j : total freight volume attracted at j zone

The calculation results are shown in Table A8-4 and A8-5 by year.

Table A8-4 Freight Traffic on Roads by SSDP - 2001 -

(tons per day)					
O	D				
	Krabi	Khanom	Center	Southern Region	Total
Krabi	0	55	334	334	723
Khanom	88	0	335	335	758
Center	143	143	0	669	955
Southern Region	143	143	286	0	572
Total	374	341	955	1338	3008

Table A8-5 Freight Traffic on Roads by SSDP - 2006 -

(tons per day)					
O	D				
	Krabi	Khanom	Center	Southern Region	Total
Krabi	0	183	1130	1130	2443
Khanom	300	0	1331	1331	2962
Center	483	484	0	2461	3428
Southern Region	483	484	967	0	1934
Total	1266	1151	3428	4922	10767

5. Passenger Transport Demand

Regional population was assumed to increase by the SSDP as shown in Table A8-1. The increased population will generate passenger transport demand intensively. Because, trip rates of them are considered to be higher. Then, future trip rates of them were assumed to be as same level as the higher group in the Southern Region. Additional vehicle trips by the increased residents in the SSDP area are shown in Table A8-6. The trips were assumed to distribute within the Southern Region according to a similar gravity formula as the freight traffic flow.

Table A8-6 Estimated Future Vehicle Trips by Increased Residents

Zone	CAR		BUS		MOTORCYCLE	
	2001	2006	2001	2006	2001	2006
Krabi	505	1707	220	705	2404	8139
Ao Luk	63	213	28	88	300	1017
Khao Phanom	63	213	28	88	300	1017
Tha Sala	63	213	28	88	300	1017
Khanom	442	1494	193	617	2103	7121
Surat Thani	42	142	18	59	200	678
Phunphin	42	142	18	59	200	678
Khian Sa	14	47	6	20	67	226
Ban Na San	14	47	6	20	67	226
Kanchanadit	91	308	40	127	434	1469
Don Sak	63	213	28	88	300	1017
TOTAL	1402	4743	612	1958	6678	22607

Note 1: Prices per metric ton

Gas/oil related industry; 10,000 Baht (LPG)
 Agro-industry ; 24,400 Baht (Margarine)
 Other industry ; 178,200 Baht (TV set)

A9 Traffic Demand on the Highway Link

By the implementation of the Southern Seaboard Development, various industries are expected to locate in the area of Krabi, Khanom and Ban Na San. Activities of the industries and a function of the Land Bridge as an international container transport will produce transport demand. In addition to the above mentioned demand, related industries for the expected industries, residential estates, commercial estates, recreation facilities, etc. would locate in the surrounding area and would generate another transport demand.

In this study, however, not all the demand mentioned above are dealt with. Only the demand by the international container transport and by the expected industries were taken into account at this moment.

The forecasted transport demand was assigned to the Krabi - Khanom Highway Link by alternative. The traffic volume in 2001 and in 2006 on the Highway Link is shown in Table A9-1 to A9-3 by alternative.

Table A9-1 Forecasted Traffic Demand on the Krabi - Khanom Highway Link - Alternative: A - (vehicle per day)

Vehicle \ Section	1	2	3	4	5
Year 2001					
ADT	310	3800	3182	3457	4661
Car	0	1257	1036	1324	2365
Truck	310	2111	1726	1814	1863
Bus	0	432	420	319	433
Year 2006					
ADT	1718	9217	9738	9706	11947
Car	0	3011	3242	3381	5211
Truck	1718	5280	5451	5396	5651
Bus	0	926	1045	929	1085

- Section 1: Krabi Port - Route No.4
- 2: Route No.4 - Route No.4035
- 3: Route No.4035 - Route No.41
- 4: Route No.41 - Route No.401
- 5: Route No.401 - Khanom Port

Table A9-2 Forecasted Traffic Demand on the Krabi - Khanom Highway Link - Alternative: B - (vehicle per day)

Vehicle \ Section	1	2	3	4	5
Year 2001					
ADT	312	4209	3265	3158	4654
Car	0	1414	1049	1216	2359
Truck	312	2322	1775	1643	1862
Bus	0	473	441	299	433
Year 2006					
ADT	1721	8924	10106	9429	10671
Car	0	2891	3316	3333	4633
Truck	1721	5126	5726	5171	5071
Bus	0	907	1064	925	967

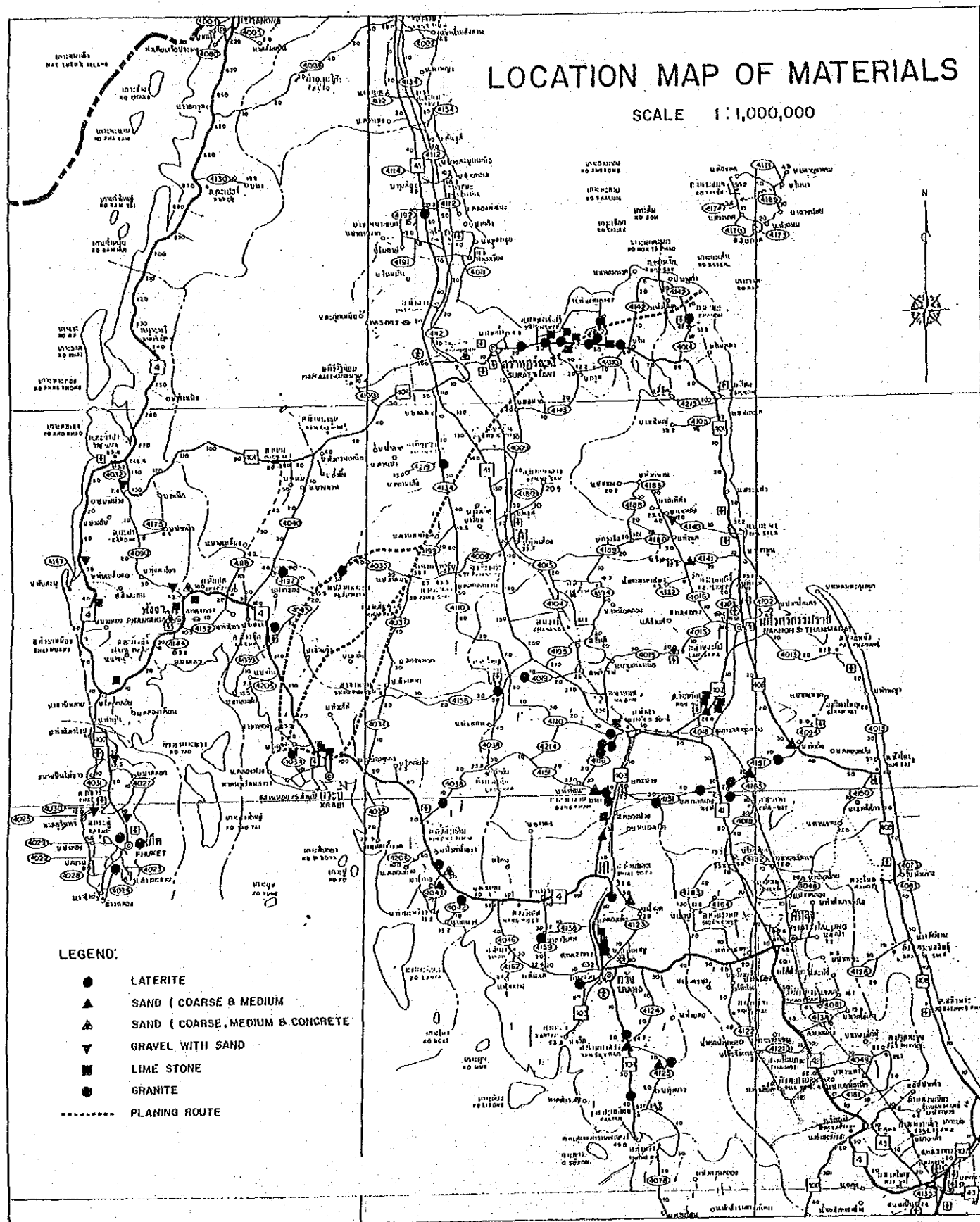
Note: Refer to the note of Table A9-1.

Table A9-3 Forecasted Traffic Demand on the Krabi - Khanom Highway Link - Alternative: C - (vehicle per day)

Vehicle \ Section	1	2	3	4	5
Year 2001					
ADT	775	3187	2695	2883	4227
Car	0	981	818	1086	2149
Truck	775	1814	1495	1518	1689
Bus	0	392	382	279	389
Year 2006					
ADT	2601	8682	9231	9036	11456
Car	0	2758	3001	3028	4937
Truck	2601	5011	5229	5165	5553
Bus	0	913	1001	843	966

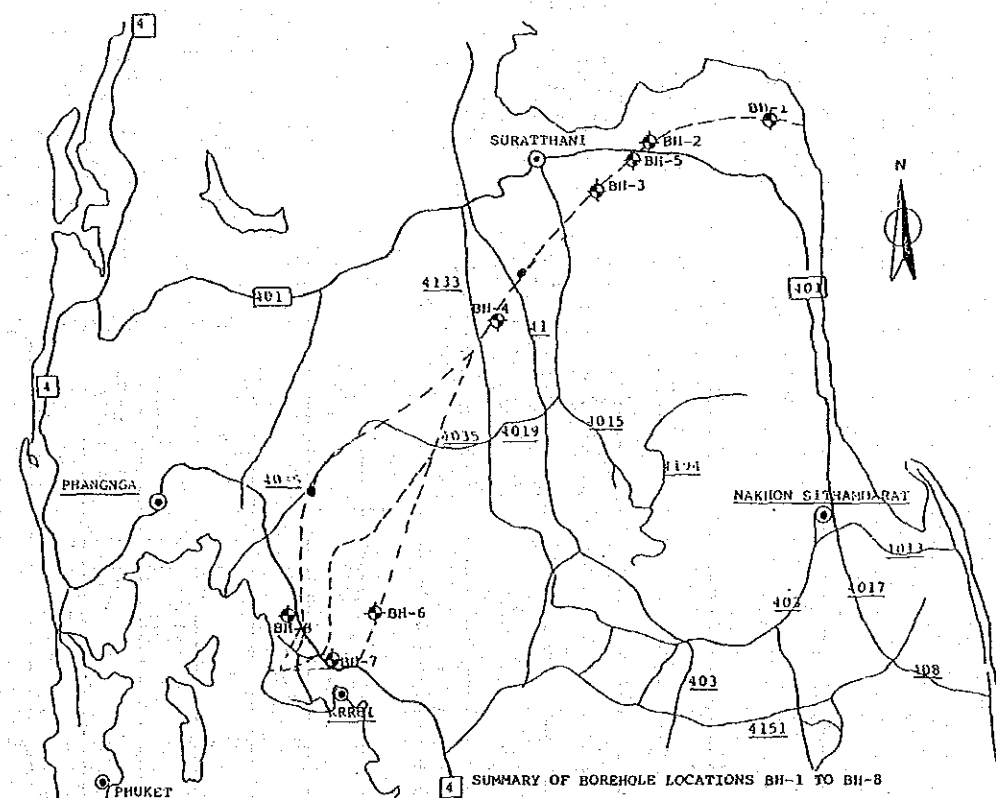
Note: Refer to the note of Table A9-1.

A10 Location Map of Materials



A11 Results of Soil Survey

BORING NO.	ROUTE NO.	KM STONE/LOCATION
BH-1	4142, DON SAK-KHANOM	35 + 800 R 3.5 m
BH-2	401, SURATTHANI- NAKHON SI THAMMARAT	54 + 000 L3 + 200 KM/ WAT UTTHAYARAM
BH-3	401, SURATTHANI- NAKHON SI THAMMARAT	32 + 000 R 5 + 000 KM/ BAN PAKKOO
BH-4	4133, SURATTHANI- KHIAN SA	30 + 000/BAN KOK KAEW
BH-5	401, SURATTHANI- NAKHON SI THAMMARAT	40 + 400 L3.0 m
BH-6	4, TRANG-KRABI	102 + 800 R 8 KM/ BAN PHO RIANG
BH-7	4, TRANG-KRABI	108 + 000 R 450 m/ BAN KRABI YAI
BH-8	4, KRABI-PHANG NGA	126 + 500 L4.5 KM



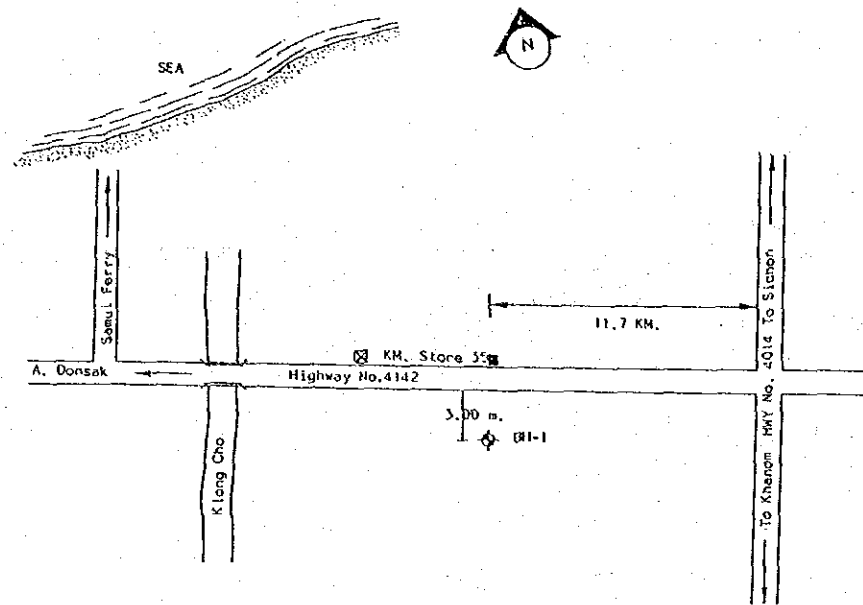


FIGURE 1 : BOREHOLE LOCATION BH-1

Pressure Ksc	90% Consol Time min	Coef. of Consolidation $C_v, 10^{-4} \text{ cm}^2/\text{sec}$	Vertical Strain, $\epsilon, \%$	SILTY CLAY Height of Sample, H cm.	initial	Final
Initial	—	—	—	Water Content, W %	25.96	
0.125	—	—	—	Degree of Saturation, S %	100	
0.25	4.84	28.70	0.74	Solid Height of Sample, Hs cm.	1.22	
0.50	4.00	34.30	1.16	Diameter of Sample, D cm.	4.50	
1	1.96	69.00	1.78	Wet Unit Weight, γ g/cc	2.07	
2	3.24	40.90	2.53	Dry Unit Weight, γ_d g/cc	1.64	
4	3.24	39.80	3.57	Liquid Limit, LL %	57.10	
8	2.56	48.50	1.97	Plastic Limit, PL %	29.10	
16	2.25	52.50	6.84	Compression Ratio, CR	0.0963	
32	2.25	49.10	9.23	Recompression Ratio, RR	0.0172	
64	1.96	51.80	12.13	Specific Gravity, G	(2.7)	

PROJECT				LOCATION															
THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND				ROUTE NO. 4142, DON SAK-KHANOM															
DATE 24/8/90				BORING NO. BH-1															
JOB No. 2785				OBSERVED W.L. -4.70 m.															
SAMPLE No.	DEPTH M.		WATER CONTENT %	ATTERBERG LIMIT %			WET UNIT WEIGHT γ_w	SIEVE ANALYSIS % FINER					CLASSIFICATION	UNDRAINED SHEAR STRENGTH kg/cm^2				STANDARD PENETRATION (N)	SPECIFIC GRAVITY
	FROM	TO		LL	PL	PI		No. 4	No. 10	No. 20	No. 40	No. 60		UNCONFINED SHEAR	FIELD VANE SHEAR		POCKET		
SS-1	2.00	2.45	12.4														17		
SS-2	4.00	4.45	13.3														12		
SS-3	6.00	6.45	18.2					100	87	66	56						19		
SS-4	8.00	8.45	24.9														28		
SS-5	10.00	10.45	24.6														57		
ST-6	12.00	12.50	26.1	57.1	29.1	28.0	2.10	100	98	93	89	CH	14.5			22.5	2.70		
SS-7	12.50	12.95	23.7														39		
SS-8	14.00	14.45	9.3														46		

PROJECT NAME: THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND			LOCATION: ROUTE NO. 4142, DON SAK-KHANOM KM. 35+800 R 3.5 m.				
OWNER			GRAPHIC LOG				
DEPTH, m.	SAMPLE No.	TYPE OF SAMPLE	DESCRIPTION OF MATERIAL	Natural Water Content (%)		SPT, N (Blow/ft)	
				O	△	□	○
				X	△	□	○
				△	△	□	○
0			Silty clay, dark reddish brown. (Top soil)				
1	SS	SS	Silty clay trace to some fine sand, reddish brown, stiff to very stiff. (CH)				17
2	SS	SS					2
3	SS	SS	Sandy clay trace to some pisolitic granule, reddish brown, very stiff. (CL)				19
4	SS	SS					28
5	SS	SS	Silty clay trace to some sand, reddish brown, hard. (CH)				57
6	ST	ST					
7	SS	SS					39
8	SS	SS	Silty fine sand, li-brown, dense. (SM)				46
			END OF BORING				
LOG OF BORING NO. BH-1			BORING STARTED. 1/8/90	RIG. ACKER	WL. -4.70 M. 24 HRS AFTER BORING.		
			BORING FINISHED. 2/8/90	FOREMAN. PD	JOB No. 2785		

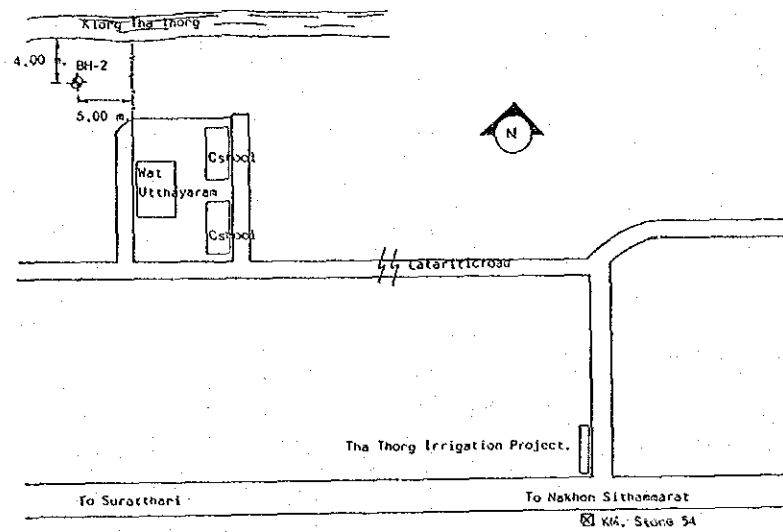


Figure 2 : LOCATION OF BOREHOLE NO. BH-2

PROJECT				LOCATION																
THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND				ROUTE NO. 401, SURATTHANI-NAKHON SI THAMMARAT KM. 54 I. 3.2 KM. AT WAT UTTHAYARAM																
DATE 24/8/90				BORING No. BH-2			JOB No. 2785			BY SCII			OBSERVED W.L. -6.30 m.							
SAMPLE No.	DEPTH (m)		WATER CONTENT (%)	ATTERBERG LIMIT (%)			WET UNIT WEIGHT (g/cm ³)	SIEVE ANALYSIS (%)					CLASSIFICATION	UNDRAINED SHEAR STRENGTH (kN/m ²)				STANDARD PENETRATION (m)	SPECIFIC GRAVITY	
	FROM	TO		LL	PL	FL		No. 75*	No. 4	No. 10	No. 40	No. 200		UNCONSOLIDATED SHEAR	FIELD VANE SHEAR		POCKET PENETRATION			
SS-1	2.00	2.45	7.6																	
SS-2	4.00	4.45	11.7																	
SS-3	6.00	6.45	25.1					100	99	84	22	SC								
SS-4	8.00	8.45	14.2									SM								
SS-5	10.00	10.45	11.9					100	95	61	29	SH								
SS-6	12.00	12.45	15.4									SH								
SS-7	14.00	14.45	12.3	38.2	20.7	17.5						CL			20.0	39	2.75			
SS-8	16.00	16.45	9.6									CL				40				
SS-9	18.00	18.14	8.0	29.9	17.8	12.1						SC-C			50/55	2.64				

PROJECT NAME. THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND				LOCATION KM. 54 I. 3.2 KM. AT WAT UTTHAYARAM			
OWNER				DESCRIPTION OF MATERIAL			
DEPTH, m.	SAMPLE No.	TYPE OF SAMPLE	DEPTH, m.	DEPTH, m.	DEPTH, m.	DEPTH, m.	DEPTH, m.
0			0	1	2	3	4
			5	10	15	20	25
			30	35	40	45	50
			55	60	65	70	75
			80	85	90	95	100
			105	110	115	120	125
			130	135	140	145	150
			155	160	165	170	175
			180	185	190	195	200
			205	210	215	220	225
			230	235	240	245	250
			255	260	265	270	275
			280	285	290	295	300
			305	310	315	320	325
			330	335	340	345	350
			355	360	365	370	375
			380	385	390	395	400
			405	410	415	420	425
			430	435	440	445	450
			455	460	465	470	475
			480	485	490	495	500
			505	510	515	520	525
			530	535	540	545	550
			555	560	565	570	575
			580	585	590	595	600
			605	610	615	620	625
			630	635	640	645	650
			655	660	665	670	675
			680	685	690	695	700
			705	710	715	720	725
			730	735	740	745	750
			755	760	765	770	775
			780	785	790	795	800
			805	810	815	820	825
			830	835	840	845	850
			855	860	865	870	875
			880	885	890	895	900
			905	910	915	920	925
			930	935	940	945	950
			955	960	965	970	975
			980	985	990	995	1000
			1005	1010	1015	1020	1025
			1030	1035	1040	1045	1050
			1055	1060	1065	1070	1075
			1080	1085	1090	1095	1100
			1105	1110	1115	1120	1125
			1130	1135	1140	1145	1150
			1155	1160	1165	1170	1175
			1180	1185	1190	1195	1200
			1205	1210	1215	1220	1225
			1230	1235	1240	1245	1250
			1255	1260	1265	1270	1275
			1280	1285	1290	1295	1300
			1305	1310	1315	1320	1325
			1330	1335	1340	1345	1350
			1355	1360	1365	1370	1375
			1380	1385	1390	1395	1400
			1405	1410	1415	1420	1425
			1430	1435	1440	1445	1450
			1455	1460	1465	1470	1475
			1480	1485	1490	1495	1500
			1505	1510	1515	1520	1525
			1530	1535	1540	1545	1550
			1555	1560	1565	1570	1575
			1580	1585	1590	1595	1600
			1605	1610	1615	1620	1625
			1630	1635	1640	1645	1650
			1655	1660	1665	1670	1675
			1680	1685	1690	1695	1700
			1705	1710	1715	1720	1725
			1730	1735	1740	1745	1750
			1755	1760	1765	1770	1775
			1780	1785	1790	1795	1800
			1805	1810	1815	1820	1825
			1830	1835	1840	1845	1850
			1855	1860	1865	1870	1875
			1880	1885	1890	1895	1900
			1905	1910	1915	1920	1925
			1930	1935	1940	1945	1950
			1955	1960	1965	1970	1975
			1980	1985	1990	1995	2000
			2005	2010	2015	2020	2025
			2030	2035	2040	2045	2050
			2055	2060	2065	2070	2075
			2080	2085	2090	2095	2100
			2105	2110	2115	2120	2125
			2130	2135	2140	2145	2150
			2155	2160	2165	2170	2175
			2180	2185	2190	2195	2200
			2205	2210	2215	2220	2225
			2230	2235	2240	2245	2250
			2255	2260	2265	2270	2275
			2280	2285	2290	2295	2300
			2305	2310	2315	2320	2325
			2330	2335	2340	2345	2350
			2355	2360	2365	2370	2375
			2380	2385	2390	2395	2400
			2405	2410	2415	2420	2425
			2430	2435	2440	2445	2450
			2455	2460	2465	2470	2475
			2480	2485	2490	2495	2500
			2505	2510	2515	2520	2525
			2530	2535	2540	2545	2550
			2555	2560	2565	2570	2575
			2580	2585	2590	2595	2600
			2605	2610	2615	2620	2625
			2630	2635	2640	2645	2650
			2655	2660	2665	2670	2675
			2680	2685	2690	2695	2700
			2705	2710	2715	2720	2725
			2730	2735	2740	2745	2750
			2755	2760	2765	2770	2775
			2780	2785	2790	2795	2800
			2805	2810	2815	2820	2825
			2830	2835	2840	2845	2850
			2855	2860	2865	2870	2875
			2880	2885	2890	2895	2900
			2905	2910	2915	2920	2925
			2930	2935	2940	2945	2950
			2955	2960	2965	2970	2975
			2980	2985	2990	2995	3000
			3005	3010	3015	3020	3025
			3030	3035	3040	3045	3050
			3055	3060	3065	3070	3075
			3080	3085	3090	3095	3100
			3105	3110	3115	3120	3125
			3130	3135	3140	3145	3150
			3155	3160	3165	3170	3175
			3180	3185	3190	3195	3200
			3205	3210	3215	3220	3225
			3230	3235	3240	3245	3250
			3255	3260	3265	3270	3275
			3280	3285	3290	3295	3300
			3305	3310	3315	3320	3325
			3330	3335	3340	3345	3350
			3355	3360	3365	3370	3375
			3380	3385	3390	3395	3400
			3405	3410	3415	3420	3425
			3430	3435	3440	3445	3450
			3455	3460	3465	3470	3475
			3480	3485	3490	3495	3500
			3505	3510	3515	3520	3525
			3530	3535			

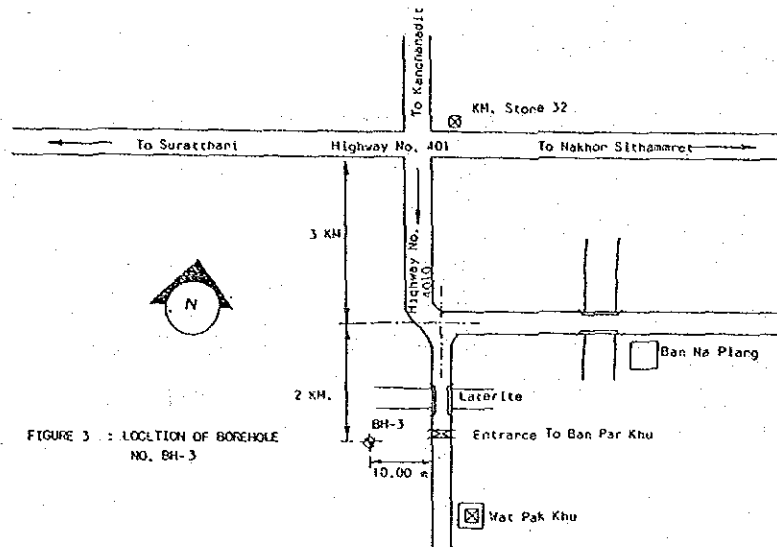


FIGURE 3 : LOCATION OF BOREHOLE NO. BH-3

PROJECT THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND										LOCATION ROUTE NO. 401, SURATTHANI-NAKHON SITHAMMARAT KM. 32 R 5.0 KM. AT BAN PAK KOO									
DATE		24/8/90		BORING No.		BH-3		JOB No.		2785		BY		SCH		OBSERVED W.L.		-1.70 m.	
SAMPLE No.	DEPTH M.		WATER CONTENT %	ATTERBERG LIMIT %			WET UNIT WEIGHT γ_{wet}	SIEVE ANALYSIS % FINER					CLASSIFICATION	UNDRAINED SHEAR STRENGTH $\sigma_{m.}^1$				STANDARD PENETRATION (N)	SPECIFIC GRAVITY
	FROM	TO		LL	PL	PI		No. 3/4"	No. 4	No. 10	No. 20	No. 30		UNCONFINED SHEAR Q_u	FIELD VANE SHEAR Q_v		POCKET PENETRATION Q_p		
SS-1	2.00	2.45	23.4																
SS-2	4.00	4.45	18.7	39.0	19.6	19.4													
SS-3	6.00	6.45	12.7						100	98	62	CL							
SS-4	8.00	8.45	15.0						100	83	39	SM							
SS-5	10.00	10.45		(No recovery)								(SM)							
SS-6	12.00	12.45	14.1	34.5	14.0	20.5						CL					22.5	51	
SS-7	14.00	14.40	9.6									CL					22.5	102/25	cm.
SS-8	16.00	16.24	8.0									CL					22.5	50/9	cm.

PROJECT NAME. THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND			LOCATION. ROUTE NO. 401, SURATTHANI-NAKHON SITHAMMARAT KM. 32 R 5.0 KM. AT BAN PAK KOO		
OWNER			GRAPHIC LOG		
DEPTH, m.	SAMPLE No.	TYPE OF SAMPLE	DESCRIPTION OF MATERIAL		GRAPHIC LOG
0			Clayey sand, brown, (Top soil) 1.50 m		<p>○ Natural Water Content X Plastic Limit △ Liquid Limit</p> <p>○ S_u (UC) ● S_u (UC) △ S_u (FV) ▲ S_u (FV) X $Q_p/2$ (t/m^2) 2.5 5 7.5</p> <p>□ SPT, N (Blow/ft) 20 40 80</p>
1	SS	SS	Fine sandy clay, yellowish brown, soft, (CL) 4.00 m		
2	SS	SS	Silty clay trace to some sand and decomposed limestone debris, reddish brown, very stiff. (CL) 5.50 m		
3	SS	SS	Fine sandy clay, whitish li-gray, soft, (CL) 8.00 m		
4	SS	SS	Silty medium to coarse sand trace gravel, li-brownish li-gray, medium. (SM) 11.40 m		
5	SS	SS	Silty clay, yellowish brown, stiff. (CL) 12.35 m		
6	SS	SS	Silty clay trace to some sand and decomposed limestone, yellowish brown some white, hard. (CL) 16.24 m		
7	SS	SS	END OF BORING		
8	SS	SS			

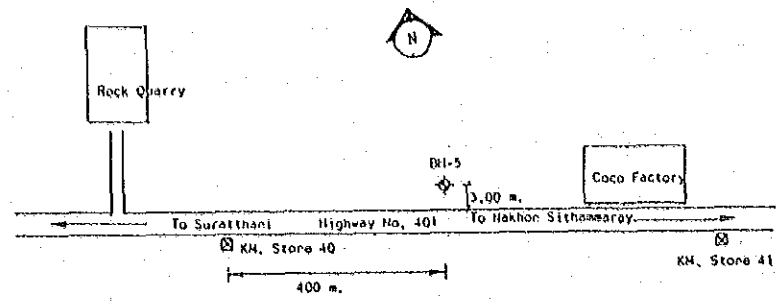


FIGURE 5 : LOCATION OF BOREHOLE NO. BH-5

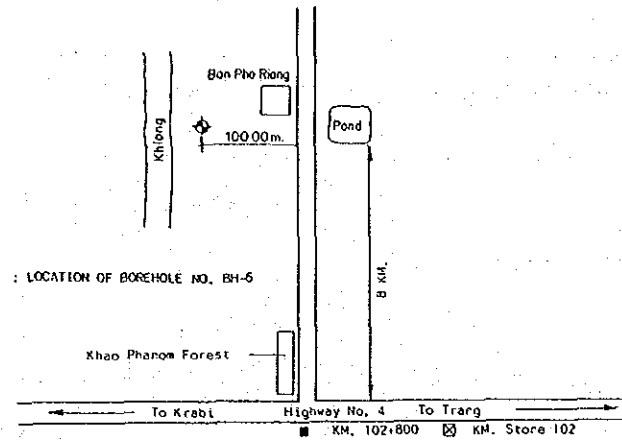
PROJECT THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND										LOCATION ROUTE NO. 401 SURATTHANI-NAKHON SITHAMMARAT KM. 40+400 L. 3.0 m.									
DATE 24/8/90		BORING No. BH-5		JOB No. 2785		BY SCH		OBSERVED W.L. -4.70 m.											
SAMPLE No.	DEPTH M.		WATER CONTENT %	ATTERBERG LIMIT %			WET UNIT WEIGHT γ_{wet}	SIEVE ANALYSIS % FINER					CLASSIFICATION	UNDRAINED SHEAR STRENGTH σ_v				POCKET PENETRATION	STANDARD PENETRATION (N)
	FROM	TO		LL	PL	FI		No. 4	No. 10	No. 20	No. 40	No. 60		UNCONFINED SHEAR	FIELD VANE SHEAR		Q _p		
SS-1	2.00	2.45	8.9					100	98	94	88	CL					22.5	10	
SS-2	4.00	4.45	12.1	42.0	20.6	21.4						CL					22.5	34	
SS-3	6.00	6.45	19.0					100	96	81		CL					22.5	26	
SS-4	8.00	8.45	18.4									CL					22.5	27	
SS-5	10.00	10.45	15.1	35.2	18.1	17.1						CL					22.5	41	
SS-6	11.50	11.64		(Rock)								Decomposed Limestone						50/5%	
SS-7	12.00	12.05		(No recovery)														50/2*	

PROJECT NAME THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND										LOCATION ROUTE NO. 401 SURATTHANI-NAKHON SITHAMMARAT KM. 40+400 L. 3.0 m.										
OWNER																				
DEPTH, m.	SAMPLE No.	TYPE OF SAMPLE	SAMPLE DIST. RECOVERY	DESCRIPTION OF MATERIAL	GRAPHIC LOG	Natural Water Content					Su (UC)					Su (FV)				
						X Plastic Limit					O					△				
						△ Liquid Limit (%)					x Q _p /2 (t/m ²)					▲ Su'(FV) (t/m ²)				
						20 40 60 80 100					2.5 5 7.5					20 40 60				
						□ SPT, N (Blow/ft)					20 40 60									
0				Silty clay, brown. (top soil)																
1	SS			Silty clay trace to some sand, yellowish brown, stiff. (CL)																
2	SS																			
3	SS			Silty clay trace to some sand, trace decomposed limestone debris at bottom, li-grayish brown reddish brown, very stiff. (CL)																
4	SS																			
5	SS			Silty clay some decomposed limestone debris, grayish brown, hard (CL)																
6	SS			Decomposed limestone, very dense																
7	SS																			
15				END OF BORING																

LOG OF BORING NO. BH-5

BORING STARTED. 6/8/90 RIG. ACKER WL. -4.70 M. 24 HRS AFTER BORING.
 BORING FINISHED. 6/8/90 FOREMAN. PD JOB No. 2785

FIGURE 6 : LOCATION OF BOREHOLE NO. BH-6



Pressure Ksc	90% Consol. Time min	Coef. of Consolidation $C_v, 10^{-4} \text{ cm}^2/\text{sec}$	Vertical Strain, %	SILTY CLAY Height of Sample, H cm.	initial	Final
Initial	—	—	—	Water Content, W %	25.00	
0.125				Degree of Saturation, S %	100	
0.25				Solid Height of Sample, H _s cm.	1.24	
0.50	1.69	83.0	0.38	Diameter of Sample D cm.	1.50	
1	3.61	38.4	0.97	Wet Unit Weight γ _t g/cc	2.09	
2	3.24	42.2	1.74	Dry Unit Weight γ _d g/cc	1.67	
4	4.00	34.3	2.79	Liquid Limit LL %		
8	14.44	8.9	4.97	Plastic Limit PL %		
16	57.76	2.1	8.27	Compression Ratio CR	0.0855	
32	60.84	1.8	12.01	Recompression Ratio RR	0.0226	
64	39.69	2.6	15.39	Specific Gravity G	(2.7)	

PROJECT		THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND				LOCATION				ROUTE NO. 4 TRANG-KRABI KM. 102+800 R 8 KM. AT BAN PHO RIANG									
DATE	24/8/90	BORING No.		BH-6		JOB No.		2785		BY		SCH		OBSERVED W.L.		-3.00 m.			
SAMPLE No.	DEPTH M.		WATER CONTENT %	ATTERBURGH LIMIT %			WET UNIT WEIGHT γ _t	SIEVE ANALYSIS % FINER					CLASSIFICATION	UNDRAINED SHEAR STRENGTH (kN/m ²)				STANDARD PENETRATION (cm)	SPECIFIC GRAVITY
	FROM	TO		LL	PL	PI		No. 75	No. 100	No. 200	No. 400	No. 600		No. 800	UNCONFINED SHEAR	FIELD VANE SHEAR			
SS-1	2.00	2.45	14.1															13	
ST-2	4.00	4.50	20.1	53.0	18.0	35.0	1.80	100	95	92	66	CH	6.2					22.5	
SS-3	4.50	4.95	20.4									CH						22.5	2.70
ST-4	6.00	6.50	22.1				2.10	100	97	95	94	CH	10.9					18.8	
SS-5	6.50	6.95	22.5				2.08	100	98	96	94	CH	19.0					21.3	17
SS-6	8.00	8.45	21.9									CH						20.0	29
SS-7	10.00	10.45	25.6									CL							53
SS-8	12.00	12.12	12.4									CL-S							50/12 cm.
SS-9	14.00	14.05	(No recovery)									Decompose limestone							50/5 cm.

PROJECT NAME		THE ROAD DEVELOPMENT STUDY IN THE SOUTHERN REGION OF THAILAND		LOCATION		ROUTE NO. 4 TRANG-KRABI KM. 102+800 R 8 KM AT BAN PHO RIANG						
OWNER												
DEPTH, m.	SAMPLE No.	TYPE OF SAMPLE	SAMPLE DIST RECOVERY	DESCRIPTION OF MATERIAL	GRAPHIC LOG							
					○ Natural Water Content	△ Plastic Limit	△ Liquid Limit	□ SPT, N (Blow/ft)				
				○ Su (UC) ● Su (UC) △ Su (FV) ▲ Su (FV) × Qp/2 (t/m ²) 2.5 5 7.5 (%) 20 40 60 80 100 20 40 60								
0				Clayey fine to medium sand, brown, loose. (SC)								
1	SS			Silty fine to medium sand trace to some gravel, brown, medium. (SM)				13				
2	ST			Silty clay trace to some sand and decomposed limestone debris, li-grayish brown, brown to reddish brown, very stiff. (CH)								
3	SS								27			
4	ST											
5	SS								17			
6	SS								29			
10	SS			Silty clay some decomposed limestone debris, li-grayish brown, hard. (CL & CL-SC)					55			
8	SS								50/12			
9	SS			Decomposed limestone, very dense					50/5			
15				END OF BORING								
LOG OF BORING NO. BH-6					BORING STARTED		11/8/90		RIG. ACKER		WL. -3.00 M. 24 HRS. AFTER BORING.	
					BORING FINISHED		11/8/90		FOREMAN. PD		JOB No. 2785	

JICA